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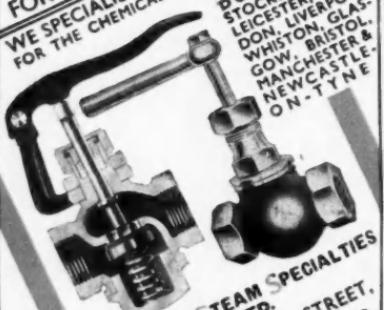
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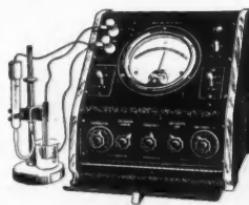




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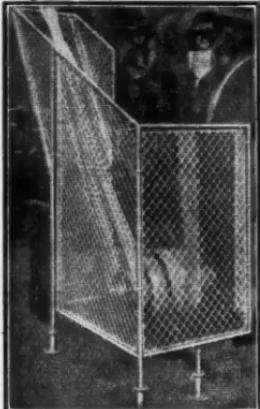
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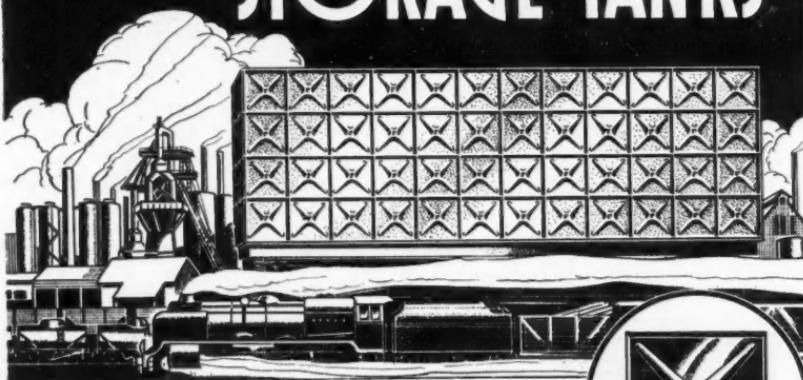
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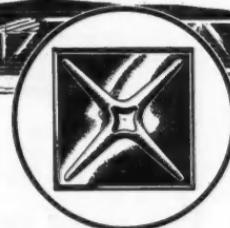
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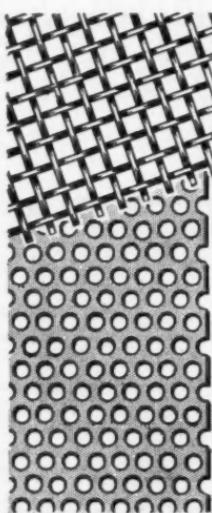
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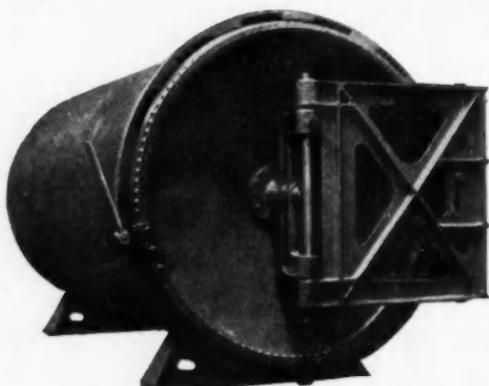
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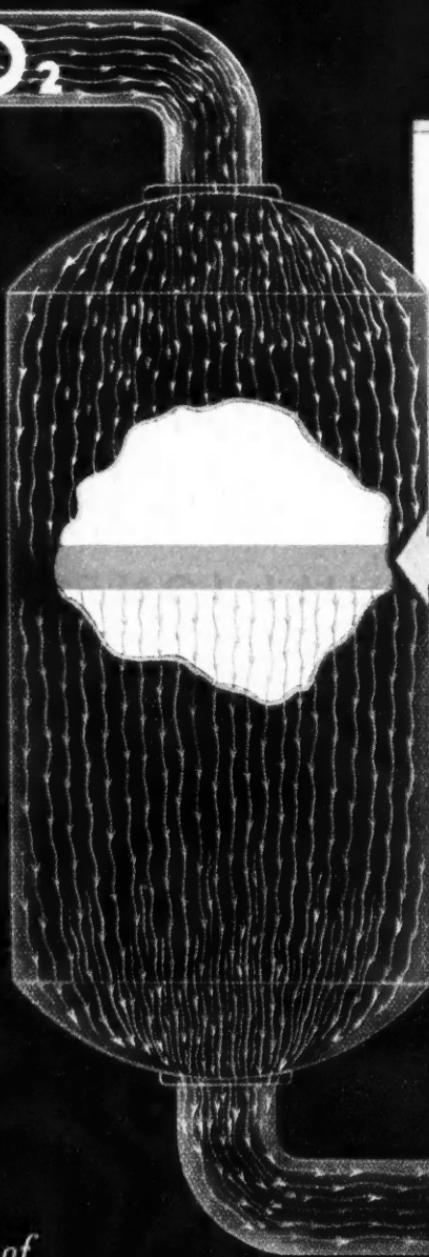
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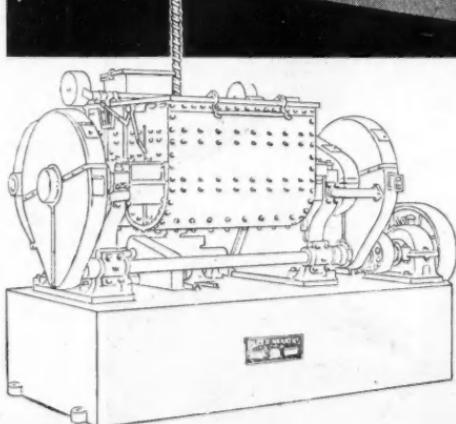
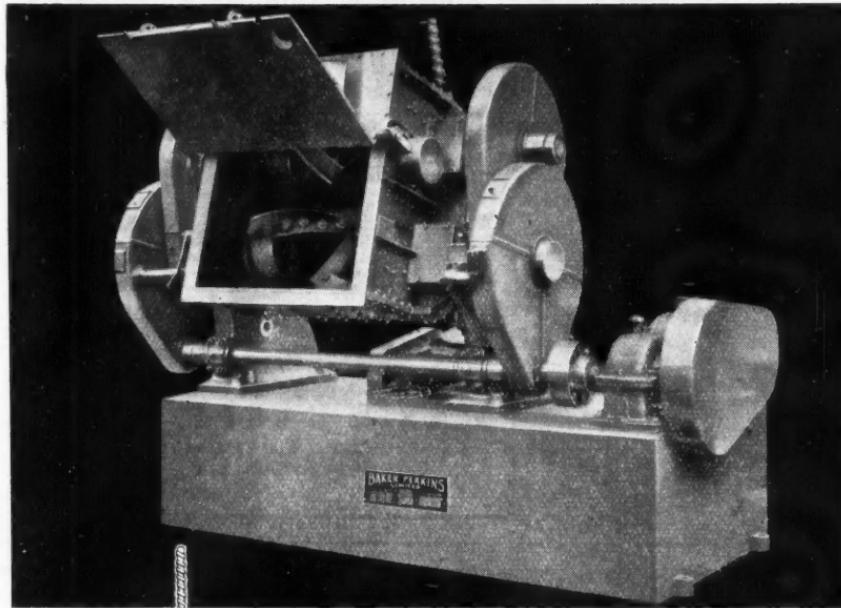
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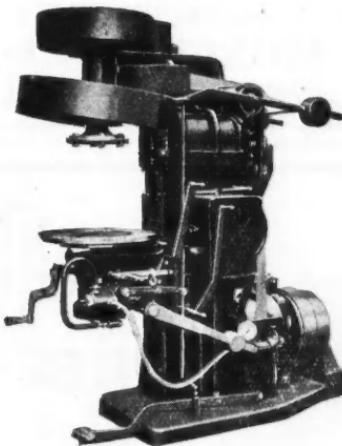
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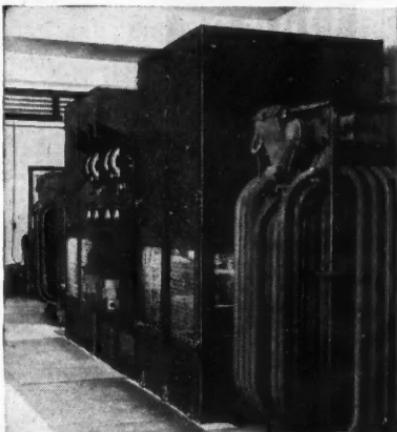
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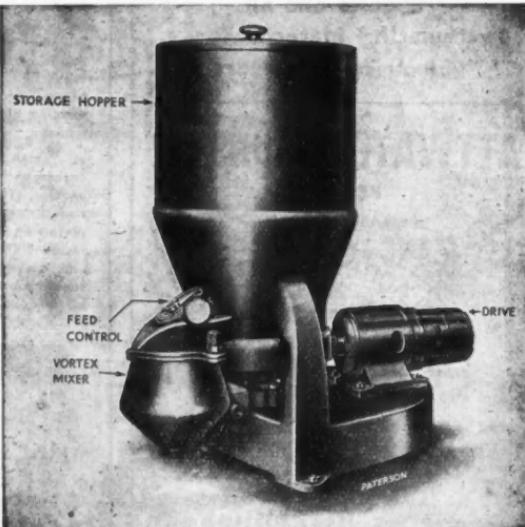
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VOL. LVIII  
No. 1497.

20 March 1948

Annual Subscription, 26s.  
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## Two Kinds of Dividends

THE ready acceptance by more than 98 per cent of the large companies contacted by the Federation of British Industries of the principle of limiting distribution of profits in the current year has shown the existence of wholly remarkable willingness to extend every possible aid to Sir Stafford Cripps. The decision may provide, moreover a very illuminating comparison of disinterestness, when it can be seen against the background which the current and future policy of the trade unions will provide.

The accommodating spirit shown by industrialists both in this connection and in response to the Chancellor's appeal for the pegging or reduction of prices unfortunately may tend to obscure the realities of the function of capital in industry. Although in present circumstances industry is content to occupy a rôle no more demanding than was the citizen-soldier's during the war, it will be as well not to overlook the fact that industry is chiefly maintained by the incentive of making profits. The resulting activity affords employment for capital and for those who are willing to work, and neither would long consent to operate were the normal rewards withdrawn.

It is of interest therefore to observe the view taken in two recent important speeches by authorities in the world of industrial chemistry. "In industry the big profits—national, corporate, and personal—come from originating new things and not from copying others—from setting the pace ourselves and not from chasing

the other fellow around the block" (Mr. W. J. Worboys in an address to the Plastics Group). "There is nothing wrong about profits. They are the wages of stockholders whose investment has made the company possible. . . . At the present time in America it costs \$24,000 to give a man a job, *i.e.*, in the average installation, including the necessary services; if one divides the capital by the number of workers to be hired one comes out with \$24,000. Unless somebody accumulates \$24,000 somewhere and puts it into the enterprise, a worker will not have a job" (Mr. Francis J. Curtis—Jubilee Memorial Lecture).

That is true on the national plane as well as under a system of purely private enterprise. Because our profits from foreign trade are now insufficient we, as a nation, find ourselves unable to undertake the new construction that we need. Nationally, corporately and individually we must make profits and we must invest them in productive, profitable enterprises. The lesson to be learned from these facts is clear. In this country we must concentrate on research which will lead to new ideas and new, profitable lines of manufacture. We must not "chase other nations round the block."

What, then, should be our research policy? We cannot rely on Government research; Government laboratories are limited in their size and scope. We must not rely too much on research associations; they do much good work, but the spur of private enterprise is the more potent and

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the opportunities of putting what is learned into practice are greater. How should the research problem be approached then? Mr. Worboys takes the view that we shall get the best results more quickly the more scientific our approach, but "above all we should not lose sight of primary objective which is to put new and profitable products on the selling range as early as possible."

Mr. Curtis points out that "whatever the reasons may be, the facts seem to show that research in England is more fundamental, more interested in 'why' than in America, which appears more interested in 'what'." The discoveries of Boyle, Faraday, Dalton and their compeers laid bare the principles which America put to practical application. "The typical American inventions, such

as the telephone, telegraph, electric light, and so forth, are applications of previously known fundamental principles, whereas in England there has been created a knowledge of such things as the neutron, radar, penicillin, and atom splitting. . . . This has worked out very well for America as long as there was a great fund of theoretical knowledge available—a great and modern chemical industry has been built.

"In my opinion," says Mr. Curtis, "England would do well to concentrate on expanding chemical engineering in all its phases, in research, manufacture, design and sales, to take advantage in the highest degree of the research knowledge it is creating." That is a point of view worth thinking over by industry and educationalists alike.

## IRONFOUNDRIES' IMPROVING OUTPUT

IMPROVEMENT in the labour force and considerable increase in production in the ironfoundry industry is revealed in a recent Ministry of Supply survey.

Labour figures show a total increase over the year of 11,106 but there are still large demands for both skilled and unskilled operatives. A census taken on January 10 this year showed that 138,168 process and maintenance workers are employed in the industry.

In connection with the introduction of a 44-hour week at the beginning of 1947, it

is observed that output per man-hour has increased from 5.58 tons per operative in the last quarter of 1946, working a 47-hour week, to 5.86 tons at the end of 1947. The total output in the fourth quarter of last year was 809,846 tons as against 709,498 tons in the similar period of 1946.

An interesting point is that plant for the chemical industry and the development of atomic energy occupies fifth place in a list contained in the survey relating to the efforts made by the iron foundry industry to meet priority demands.

## NOTES AND COMMENTS

### Planning and Performance

### Giving a Lead

If the "Economic Survey for 1948" had been intended only as an antidote to apathy and to stimulate discussion it might stand as the most effective stroke yet achieved by Sir Stafford Cripps, whose now-familiar style of exposition identifies him as its author. There is unfortunately little reason for believing that its apparent intention—to disperse all the forces capable of impeding the greatly increased productive effort required in 1948-49 (as it was in 1945-48)—will receive the support it deserves from the quarters which to-day hold many of the master keys. How, it may reasonably be asked, is the production of the chemical industries to be raised by 12 and 17 per cent in the current and second halves of this year if, as the "Distribution of Industrial Population" in the same survey makes clear, the number of chemical workers is to be pegged at 335,000—1000 fewer than were needed to hold the volume output in 1917 at 46 per cent above the 1938 level. The target for the end of this year is 173 per cent of the pre-war output. Nevertheless, it can be taken for granted that all sections of chemical industry will do whatever is possible to translate the Crippsian blueprint into reality, within the limits of the resources permitted to them. As a most realistic study of how that is to be done the judgment of Mr. N. M. Peech, chairman and managing director of the Streetly Co., Ltd., which appears in that company's annual report, seems to put the matter in a nutshell. "There is only one short-term remedy," declares Mr. Peech, "and that is longer hours of work and hard work, together with adaptation and innovations in production methods and practices, to yield greater production from the existing plant and facilities. The longer-term cure lies in the re-equipment of industry, which in some cases necessitates the building of new works, to raise production per man employed to the competitive level set in the last decade by America." Those sentiments, we suggest, deserve to be framed and incorporated in the decoration of every Governmental planning department.

**I**N a letter to the Chancellor of the Exchequer, Sir Frederick Bain, president of the Federation of British Industries, announces that widespread acceptance has been given by public and private companies to the principle of limitation of dividends in the next 12 months, as recommended in the "Report on Prices and Profits" which the three principal organisations representing industrialists recently adopted. He states that, having referred the matter to some 580 of the largest industrial companies, he had received almost immediately replies from two-thirds of them, of which the public companies alone represented paid-up capital of more than £2160 million. Approval of the principle of limiting dividends was given in 98.8 per cent of the replies, the writers of which employ collectively some 1.4 million people.

### Profits and Dividends

**I**N accepting the invitation of Sir Stafford Cripps to submit proposals for effecting a reduction in prices and for stabilising profits and dividends, the Federation of British Industries and associated organisations started their task under the handicap of prior conditions which destroyed any hope that their report would help towards early and complete restoration of economic health. The report rightly presents the conviction of the FBI that no lasting improvement can be achieved unless the Government reduces or postpones its own expenditure in all categories "not strictly essential to the economic or strategic survival of the country"—and in that field alone there is boundless scope for useful action. More might have been made in the report of the point that profits must be related to turnover rather than to capital, and the statement that in many cases any reduction in prices would turn profits into losses might well have been emphasised. The real problem is production or turnover, and the simple truth is that big profits offer the straight and easy road to big production and low prices. It is common knowledge that many businesses

struggling to function between controls at both ends produce extraordinary profits—the result not so much of enterprise or activity, but of regulation and limitation. The remedy is to be found in the relaxation of the rules, the opening of opportunities for activity in new directions and a general move towards liberty. To legislate for the limitation of dividends is to open the floodgates of extravagance. Money should not be kept in the coffers of a business unless it is required for the definite purpose of that business. Legislation which limits the dividend to some artificial figure puts the money into the hands of those with inadequate incentive to take care of it. Limitation of dividends to propitiate public prejudice is obvious inflation.

### Free for All

THE lot of the patentee in the U.S.A. is frequently not altogether a happy one, and in Canada also there is to-day plenty of support for the faction which would be glad to deprive the chemical "monopolist" of the fruits of a company's individual research. In the U.S.A. baiting the patentee, using the anti-trust laws as a ready-made if not very effective goad, seems to have become almost traditional. In this country, too, signs have lately been discernible that there is a body of opinion, including some members of the Government, which would like to see the concept of public ownership of all means of production extended to embrace patented processes. There is inevitably a lot of confused thinking about the operation and alleged abuses of chemical patent rights; the very able study of the responsibilities and privileges of the patent holder by the vice-president in charge of research work of Shawinigan Chemicals, Ltd., in *Canadian Chemistry and Process Industries* (extracts of which appear on pp. 390-392 of this issue) helps to put the matter in a more balanced perspective. The case for the preservation of the patent system in its present form could rest fairly securely on one submission alone: private enterprise in chemical research—without which industry would scarcely have emerged from the hand-loom stage of development—is a costly business and would certainly not be maintained if its hard-won rewards were made free for all.

Quixotically to persist in research in such circumstances would be to invite bankruptcy. Only slightly less absurd is the alternative which is tentatively mentioned from time to time, both here and in North America. That is that all scientific and industrial research should be carried on under Government control and the results distributed to all. The DSIR, which in this country is the closest approximation to that idea, is among the most convinced and generous supporters of other research organisations directly allied to industries which in a fully nationalised society would, one supposes, be regarded as freebooters.

### Patent Collectors

FOR most of us the foregoing is almost self-evident, but acceptance of things as they are is evidently not universal at the moment. There is, however, one department of the existing patent laws in which the rights of those who undertake research are less easily defended. One course of chemical investigation is capable of laying bare a basic principle from which a whole chain of chemical developments may conceivably proceed. The temptation to secure with one broadside aimed at the Patent Office a multiplicity of rights of chemical manufacture is not easy to resist. More than one action in the High Court has served to show that existing patent law does not always prevent the registration of almost omnibus patents, which is certainly not in the public interest. The reservation to one company, or group, of chemical processes for future development at an unspecified date seems to be the principal defect in existing patent procedure, and to this sponsors of new legislation might well devote their innovating spirit.

### "Licences of Right" Cancellation

A notice contained in *The Board of Trade Journal*, March 13, states that the Metal and Thermit Corporation has applied for cancellation of the Indorsement "Licences of Right" on Patent No. 564489 dated August 12, 1942, and granted them for an invention entitled "Tin Plating from Potassium Stannate Baths."

## Molasses to Cost More

### Prices of Derivatives Will Rise

THE Board of Trade has announced that, due to the increased cost of molasses purchased from abroad, the selling price for all purposes other than cattle feed will be increased as from April 1, 1948. This, the Board points out, will involve an increase in the production costs of industrial alcohol and solvents derived from it but not necessarily an increase in the selling price of all such solvents, having regard to alternative methods of production.

A new order is about to be issued revising the existing maximum selling prices prescribed for these commodities.

The current official price schedule provides that the charge for molasses to be used in distilling and the manufacture of solvents shall be at the rate of 3s. 6d. for each 1 per cent of sugar content per ton. For other uses, excluding cattle feed, the official price is £10 per ton and £10 5s. per ton for consignments of less than eight tons.

The Board of Trade elaborates its announcement of a future price increase by noting—

"There is still a world shortage of molasses due to effects of the Japanese occupation of Java and it now commands a price out of all proportion to the pre-war price. The bulk of world supplies comes from Cuba, though some is also obtained from the British West Indies the United Kingdom sugar refiners and the sugar beet factories. All the purchases are on Government account, and selling prices are statutorily controlled, these arrangements applying also to the principal derivatives."

## TRADE WITH PALESTINE

DU<sup>E</sup> to the removal of Palestine from the sterling area, import licences issued before February 22, 1948, are now declared invalid except for that portion of the licence for which confirmed credit has been opened. Goods arriving in the country against invalidated licences will only be released from Customs on production of documents certifying shipment was made before March 15, 1948.

New licence applications for subsequent shipments will only be considered if terms of payment are against letters of credit. New applications where the terms are cash against documents, cash on delivery, or on current account, will not be considered. Imports which have already been received on consignment (including consignments in bond) must be declared before March 22, 1948, to the Controller of Foreign Exchange or transfer of currency will not be considered.

## Record Steel Output

### 1948 Target Figure Exceeded

FOR the first time in the history of the industry British steel production in February exceeded an annual rate of 15 million tons. Weekly output last month averaged 289,400 tons and production for the first two months of this year was at a higher level than is needed to meet the 1948 target of 14 million tons, even allowing for a fall in production during holiday periods.

### Search for Scrap

Mr. G. R. Strauss, Minister of Supply, has stated that he hopes to receive by Easter the first report from the special committee recently appointed to investigate the scrap metal position in Germany. The committee will, in addition, examine the possibilities of new supply sources in Britain and may visit other countries.

Pointing out there were millions of tons of scrap in Germany beyond what could possibly be used in German steelworks, Mr. Strauss said the collection of scrap at home had improved during the last few months, but stocks last month were only 348,000 tons, against 534,000 tons in February last year.

The programme of scrapping battleships would provide as much as the yards could handle in the next 18 months, and they were considering extending the capacity of some of the yards. The total amount of scrap from warships was very small.

## MINISTRY ALLOCATIONS

THE complete list of raw materials<sup>†</sup>, supplies of which are either allocated (or supervised) by the Board of Trade, is as follows:—

*Allocated between the different Ministries* before each Ministry splits up the allocation for the purpose for which it is responsible: Castor oil, cotton yarn and cloth, linseed oil, manilla copal, paper and board, sisal, steel, timber and plywood.

*Allocated by the Board of Trade*: Acetates, acetic acid, acetic anhydride, acetone, amyl alcohol; bichromates, borax, boric acid, bristles and fibres, butyl alcohol, butyric acid; carbonate of potash, casein (lactic and rennet), caustic potash, caustic soda, cordage (including binder twine); dipentene, ethyl alcohol; glue and gelatine, glycerine, gold; formvar, freon gas, furfural, fusel oil; hemp; leather, lithopone; methylene chloride, molasses; officina oil, oxalic acid; paraformaldehyde, permanganate of potash; resins (certain types including rosin and liquid rosin); soda ash; titanium dioxide, titanium oxide; urea; vulcanised fibre, white lead.

*Allocated to established consumers generally or to established consumers in the trade or industry specified*: Calcium chloride; carbon black; cellulose polish and French polish (furniture manufacture), cotton yarn and cloth<sup>‡</sup>; hides and skins; jute<sup>‡</sup>; linseed oil (paint, artists' materials, linoleum, leathercloth); mirror glass<sup>‡</sup>; nitrogen; paper and board<sup>‡</sup>; phosphate rock, pine oil, potash pyrites; rayon yarn and cloth<sup>‡</sup>; silk yarn and cloth<sup>‡</sup>; steel<sup>‡</sup>; sulphur, tanning materials, timber and plywood<sup>‡</sup>; willow rods and sticks, wood pulp, woollen yarn and cloth<sup>‡</sup>.

<sup>†</sup>In certain categories to established firms only.

<sup>‡</sup>The Chemical Age Year Book, 1948, pp. 77-98.

# Welsh Industry and the Crisis

## Monsanto Chief Urges Development of Research

THE part scientific research can play in Wales and Monmouth and the contribution of Welsh industry towards overcoming the economic crisis were discussed at a conference at Cardiff on March 10. Sir William Griffiths, of the Mond Nickel Company, and a member of the F.B.I. industrial research committee, presided. Among those who contributed to the discussion were Dr. W. D. Scott, of Monsanto Chemicals, Ltd., and Mr. H. Davies, of I.C.I., Ltd. (Metals Division). The conference was organised by the F.B.I. and the Industrial Association of Wales and Monmouthshire.

Sir William Griffiths said :

"We must face the fact that no scientific research we may initiate now is likely to affect the situation during the next several critical months. Our first responsibility must be to see that we do everything practicable to ensure that the mass of scientific and technical knowledge now available is promptly applied in our industry."

### Need for Research

Dr. W. D. Scott said the chemical industry had been growing in North Wales for over eighty years, and was greatly extending its activity in the South. "We must frankly admit that little research has been conducted in Wales, much of the industrial progress being the result of research outside the region. The chemical industry has undertaken some research in Wales, but this has been due to the fortuitous siting of the industry rather than to the choice of a Welsh environment for creative endeavours.

The industry is becoming diversified, however, and it is most important to build up an environment which will encourage new industries to develop research activity, otherwise their further development in the region will always be prejudiced.

### University's Part

"The University of Wales"—Dr. Scott continued—"should be prepared to strengthen the research departments of its constituent colleges to an extent whereby they can make many outstanding contributions to scientific and philosophical knowledge. This will necessitate attracting men of high scientific calibre to the colleges. If such a development can be conceived, students from inside and outside the region will be attracted, an important factor in ensuring the industrial future of the region. The basic industries seem to have failed to attract those seeking creative endeavours. To-day, however, industry can provide such a variety of careers that any individual

choosing an industrial life can look forward to a stimulating and fascinating career, and feel that he is making a major contribution to the future of the country. Industry must educate the schools and universities, and must seek to attract those trained in scientific method and practice through their research departments."

In Dr. Scott's opinion the educationalist would not be capable of interpreting industrial needs unless he were intimately acquainted with the diverse problems of industrial life. The educational institutions needed to keep an ever-open door to the prime needs of the industrial and social systems.

An informative paper dealing with the dependence of progressive industry on scientific and technical research and its application to the past, present and future of industry in Wales, was delivered by Mr. Harry Davies. "Wales has operated on too few basic industries which, in the main, have been interdependent," he declared. Unbalanced economy had resulted.

## Design Week Wales

FINAL arrangements have now been made for Design Week Wales which will be held in the National Museum of Wales, Cardiff, April 12-17. The programme of conferences and the exhibition "Design Fair" are being organised by the Council of Industrial Design in co-operation with the industrial and commercial organisations of Wales and Monmouthshire, the local and education authorities and the women's and youth voluntary organisations of the Principality. In addition, many professional and cultural bodies are participating in or supporting Design Week Wales. On the first day of the exhibition, Sir Charles F. Goodeve, Director of the British Iron and Steel Research Association, is to be one of the principal speakers at the Industrial Discussion Conference on "Light Engineering and Hardwear."

**£2 m. Wrexham Project.**—A large development programme in connection with the Wrexham Trading Estate and chiefly involving British Celanese, Ltd., has been approved by the Board of Trade. The plan includes development of existing buildings, erection of new premises and the construction of a new power station. British Celanese, Ltd., is to proceed in stages with a £2 m. expansion.

# WORLD ATOMIC RESEARCH

## Developments at Harwell, in the U.S.A. and Canada

**R**EPORTS of progress in atomic energy research come this week from three widely separated educational institutions—California University, Oxford University, and Queens University (Canada). Further light has been cast on what has been done and is in prospect at the Government atomic research station at Harwell by Dr. H. W. B. Skinner, deputy director there. This lecture, however, was given in September last and only now has been made public by the Ministry of Supply.

Dr. Skinner told the Atomic Scientists' Association that the graphite low energy pile at Harwell, which began to operate last August was capable of producing monthly five to ten curies of radio-phosphorous of low specific gravity.

In the next pile to be installed at Harwell, which it was hoped would be working during 1948, the power of operation would be in the region of several thousand kilowatts, and the cooling of the uranium would be accomplished by passing a high-speed stream of air in the channels round the rods.

This pile would operate at a neutron-flux of something like 100 times that of the "gleep," thus making possible the full production of nearly all the radioactive tracers required for this country. A few useful isotopes would be limited in quantity and a few others only manufacturable by the use of a cyclotron. The pile would also provide a powerful source of fission products, distributed among the 35 elements from zinc to gadolinium, and a small quantity of plutonium for experimental work.

Most important objectives at the moment were to find more efficient means of using uranium 235.

### New Atom Particle

The discovery of an atom particle known as a meson is announced by Dr. Ernest Lawrence and Mr. James Fish, of the U.S. Atomic Energy Commission, following successful experiments at the University of California. The new particle, which was produced in the university's 4000-ton cyclotron, will give scientists their best tool for discovering what particles there are in the nuclei of the atom, says Dr. Lawrence. Associated with him is a Brazilian physicist, Dr. Cesare Lattes, who had previously worked with a British group at Bristol, and Dr. Eugene Gardner, a U.S. radiation physicist.

### Betatron at Oxford

With the presentation last week of a betatron produced by the British Thomson-Houston Co., Oxford enjoys the distinction

of being the first British university to possess an atom-splitting machine. It will commence to operate in about five weeks, and will make an important contribution to British atomic research.

### Synchrotron for Canada

A 70-million electron-volt synchrotron has been purchased by Queens University, Canada, from the Canadian General Electric Co. for numerous experiments in atomic research. It is to be installed in a special underground chamber and operated by remote control.

## Export Industry Jeopardised

### Welsh Firm Seeks Government Sanction

**T**HE survival of an engineering works near Wrexham, making textile processing machinery and preparing to produce plant for oil refinery and chemical industries, may depend upon efforts now being made to secure Government sanction for building developments.

A representative of the firm, Hughes & Lancaster, Acrefair, near Wrexham, which has operated for more than 50 years, said that an application for authority to rebuild made some months ago had not received approval, but the case was now being resubmitted, with the full support of the Ministry of Supply (Cardiff) the Welsh Regional Controller, two M.P.s (Mr. Robert Richards and Sir Henry Morris-Jones), and Denbighshire County Council.

The factory was recently acquired by a Derbyshire firm, Butterley Co., Ltd., and it was decided to replace a dilapidated section of the buildings with a steel-framed structure. Since that decision was made the local authority had ordered the demolition of a portion of the works as a safety measure.

The secretary of the firm, Mr. C. H. Bowyer, said last week, "Demolition would paralyse production and force at least a partial closure, cutting out 50 per cent of our labour unless the new building can be erected. Only two other firms in the country manufacture on similar lines and there exists an almost unlimited market for this type of machinery. A big expansion is warranted for overseas business. An integral part of our expansion would be work closely related to the oil refinery and chemical industries."

Mr. Bowyer added that the Shell Refining Co. had told them that a fraction of their requirements would fully utilise the proposed new buildings for several years to come. Denbighshire County Council has passed a resolution in support of the scheme.

# CHEMICAL PATENTS ARE INDISPENSABLE

## Safeguarding the Fruits of Costly Research

by R. S. JANE (Vice-president in charge of research and patents, Shawinigan Chemicals, Ltd.)

**I**N recent years the patent systems of the more highly industrialised countries of the world have been under close scrutiny from the public at large. The part that patents have played in the creation of monopolies and cartels, resulting in so-called price-fixing practices and the lessening of competition, has led some to assert that our patent systems have failed to keep abreast with the ever-growing complexity of modern industry.

Some of the larger and more progressive corporations have been accused of exploiting laws to serve their own monopolistic ends, creating for themselves unfair competitive advantages, which are not only contrary to the intent of the Patent Act, but are also not in the public interest. Rumours gradually grow into lengthy articles, which are usually a confused mixture of truth, half-truths and misrepresentations, with a generous proportion of misinformation.

### Misrepresented

As a result of adverse publicity given to monopolies and cartels, there has grown up on this Continent a radical or left-wing element which is attempting to undermine the foundations of our industrial system by advocating a very drastic curtailment, if not the complete elimination, of the patent monopoly.

Much of the misunderstanding of the patent system and its association with monopolies and cartels originates in the erroneous notions that many people have with regard to patents. There is a lack of clear understanding of the nature of the patent monopoly and the compelling reasons for granting a monopoly to the discoverer of a new product or process.

A patent is the means by which an inventor's right in an invention is confirmed or made secure. Without a patent he has the right to his own creation but is helpless to protect his invention against appropriation by others, except by concealment. In payment for a temporary security, he first discloses his invention, but later upon expiration of the term of the patent—that is, in

\* In a detailed study in *Canadian Chemistry and Process Industries* of the beneficial operation of patent rights in Canada and the U.S.A., and of the basis of the frequent attempts to discredit the principle there.

about 17 years—it becomes free to be used by anyone who so desires.

It is frequently inferred that our patent laws give the owner of a patent the exclusive right to make, use, and sell his invention. This right does not flow from the patent; as a matter of fact, the inventor has this right without a patent. All the patent does is to provide an incentive, first, to invent; and then to disclose the invention by giving the patentee the right to exclude others from practising the invention for a limited period of time—that is, the statutory life of the patent.

The patent merely gives the inventor or his assignee, who may be a company or a corporation, a head-start in the field.

### Importance of Patent Monopoly

It is now generally accepted that research is essential to the life of modern industry. It is an industrial vitamin, without which industry becomes decadent and its products obsolescent. A substantial percentage of all the large chemical corporations on this Continent are spending upwards of 3 per cent of their gross income on research, amounting in the aggregate to more than \$500 million per year.

As a natural result of successful research many more millions are spent in plant and equipment to operate the process by which the newly discovered products are produced. Thousands of men and women are gainfully employed in building and operating such plants.

Has it ever occurred to you that only a fraction of this money would have been spent, and consequently a relatively small number of these people would have been employed, if industry did not have the means of protecting its investments that it is afforded by patents?

Plastics, artificial fibres, such as nylon, celanese and rayon; textiles, radio, electronic equipment, drugs, surface coatings, ferrous and non-ferrous alloys—to mention only a few—are industries that had their origin in the incentive created through patent protection.

Chemical industry as we know it to-day would not exist had there been no patent system to protect the capital invested, particularly in the early stages of the development. Yet there are people in Canada and

the United States, some of them in influential positions, who would deny to industry the protection resulting from a patent system.

### Return to Secret Processes

The question is frequently asked—what would be the situation in the event that by some stroke of misfortune our patent system were abolished? It is the writer's opinion that we would soon return to the old system of secret processes carried out behind closed doors and industrial espionage would soon be rife—a condition that existed before the Statute of Monopolies (the first patent system) was instituted in England in the reign of James I.

The workers and technical staffs alike would be under some sort of contract with the employer, and men and women would no longer be free to come and go as they pleased as is the case to-day in chemical industry in this country. The technically trained men particularly would lose most of the freedom they now enjoy as the employer would certainly demand a rigid contract.

Furthermore, developments that were not readily amenable to secret operation would not be attempted; and, what is more important, no scientific information of value to others would be published.

It is usual for a company which develops a basic material—a synthetic resin, for example—to protect itself by taking out patents in all the important industrial countries of the world as a patent issued in one country affords no protection whatever in another. In due course, after the issue of the patents, applications come in from companies in one or more of these countries requesting a licence under the patents so that they can produce and supply the local demand for the new resin. Generally a request of this nature is granted and an agreement is drawn up fixing a royalty to be paid, together with other conditions which the licensor sees fit to impose on the licensee.

### Common Safeguards

The latter may be restricted in the sale of the product to his own country—that is, he must not export—or the licence agreement may limit the sale of the resin to one or more industries in that country because the patent owner may wish to reserve certain industries to be supplied by other licensees who have also made application for a licence.

Furthermore, the licensor may wish to set the range of price in which the licensees must sell the product in order to ensure a wide distribution of the product; also if the product is sold at a much lower price

in one country than in another, or to one industry than to another in the same country, by competing licensees, it will not be long before a cut-throat competition has developed and no one will obtain a fair return on his investment.

Expansion involving a number of companies in a given field leads to further research, and consequently more patents are filed, which invariably come into interference in the Patent Office and tend to overlap when finally issued.

In recent years there has been an increasing tendency to prevent delays in the Patent Office and avoid expensive infringement litigation by arbitrating the interferences and cross-licensing both past and future patented developments, generally on a royalty-free basis.

Usually the parties to the cross-license arrangement agree to free and prompt exchange of ideas and research information, which makes available to each party the combined experience of all. This procedure facilitates and stimulates research, prevents unnecessary duplication of effort, speeds up commercial development, and avoids expensive and time-consuming litigation.

### "Patent Pools"

In spite of the fact that patent agreements, including cross-licensing arrangements such as described above, are based on fair and sound business principles, they are the object of much uninformed criticism and are frequently condemned as "patent pools" leading to vicious monopolies, which not only contravene the anti-trust laws but also are contrary to the public interests.

It is in the writer's opinion impracticable to deal with patents by anti-monopoly legislation for the reason that the granting of a patent is in its very essence the granting of a monopoly by the State itself.

The opponents of the patent system are always very much concerned about the "public interest" when patent arrangements of any kind are involved. An impartial analysis of a licence agreement as outlined above clearly demonstrates that the public is invariably on the receiving end whenever a patent is issued and subsequently placed under licence.

Through initiative and enterprise the corporation (the patent owner) at a considerable risk of money has carried out research and discovered a new process and a new product which has been described in detail to the public in the form of a patent. In return for disclosing its secrets and giving the public the benefit of its discoveries, the company is granted a monopoly of the invention for 17 years.

(Continued overleaf)

## Italian Chemical Exports

### Good Prospects for Basic Chemicals

THE outlook for 1948 for the Italian chemical industry is hopeful as a number of factories have increased their potential and are preparing for export production. Towards the end of last year the total output of the heavy chemical industry reached 60-70 per cent of the pre-war figure and, in spite of the crisis, in many sectors production continues to increase, as is the case with fertilisers.

Chemical industry in Italy at present engages some 120,000—about 3 per cent of all industrial workers. The majority of them are skilled workers.

Before the war about 25 per cent of the total output of Italian chemical industry was exported. At present the exports of soda are doing well and there are good possibilities for hydrochloric, sulphuric, boric and tannic acids as well as for borax and phosphorus. The products of Belgium, France, Great Britain, Switzerland and the U.S.A. are, however, becoming formidable competitors. The need to spend a great deal more on research is now being recognised.

During 1947 the output of Portland cement in Italy reached 3.6 million tons as compared to the pre-war figure of 4.5 million.

#### CHEMICAL PATENTS ARE INDISPENSABLE

*(Continued from previous page)*

Is it not obvious that in exercising the patent monopoly the company is not taking anything away from the public that it had before the monopoly was granted? In fact, all along the line the public is being given something it never enjoyed before, in the form of new processes, new products and frequently new wealth.

It is difficult to see wherein the patent monopoly renders an injustice to anyone. It is frequently said that a patent gives a company or an individual owning the patent the power to charge exorbitant prices for a commodity without fear of competition. Theoretically, this is possible, but practically it is a short-sighted policy and rarely indulged in by progressive corporations. All business men know that there is no more certain method of inviting competition than by over-pricing a commodity. The competition comes not by infringement or evasion of the patent by others endeavouring to reproduce the patented product, but more likely by the introduction of cheaper substitute materials which the public will buy rather than pay exorbitant prices for the patented product.

On the other hand, there are times when high prices for a commodity are justified, particularly if it hap-

## Magnesium Minerals

### Spain's Neglected Resources

IN a review of recent metallurgical progress in magnesium, Pedro Lopez Gomez describes generally the global situation in respect of available raw materials, and the various methods, such as electrolysis, used for recovery of magnesium (*ION*, January, 1948, 8, 18-26). He deplores the fact that, so far, little has been accomplished in Spain in this important industry, despite the country's wealth in essential minerals, such as dolomite, gibbsite (impure magnesite,  $MgCO_3$ ) and carnalite, all of which are distinguished by high magnesium content; the Spanish minerals are sometimes superior to the foreign. The slow progress in the development of these materials is attributable to insufficiency of electric power. To cover Spanish requirements in magnesium the author estimates that electric energy of the order of 180-200 million kWh annually is necessary. In view of the fundamental importance of magnesium and its alloys in automobile, aircraft and numerous other manufactures, Spain's need to develop her resources in this field without further delay is abundantly evident.

pens to be a synthetic material appearing on the market for the first time. All too frequently does the public jump to the conclusion that the manufacturer has eliminated all competition through exercise of the patent monopoly and is free to charge all the traffic will bear.

What is not always appreciated in a case of this kind is that the development of a synthetic product from basic raw materials to the point when it is ready to put on the market is an exceedingly costly undertaking. In the case of products like nylon and the vinyl resins, for example, the research and development charges run into many millions of dollars.

Moreover, the capital risk in such an undertaking is extremely great owing to the rapid technological advances in this field, which make it possible for a superior product to come on the market to replace the first long before the development costs have been paid for.

In conclusion, I hope that what has been said will impress upon you the extreme importance of our patent system in maintaining the industrial progress of the country. Those who would destroy it have based their attitude on misinformation and a complete lack of knowledge of the mechanism of industrial progress based on research and development.

## Industrial Uses of the Power Cartridge

### Wide Potential Application Forecast

**P**ROMINENCE has been given this week to the power cartridge, a source of energy which originated in the latter half of the nineteenth century, but which was developed extensively during World War II, and applied widely in the fields of aviation, agriculture, and land and sea transport mainly for engine-starting. I.C.I. (Explosives Division) has provided at its Ardeer works an exhibition revealing how widely the principle is being applied.

The principle of the power cartridge resembles that by which a gun is fired, with the difference that the energy is released more slowly. It is subject to greater control, and is therefore capable of being applied usefully and economically for industrial purposes. The cartridges are in appearance the same as large or small bore ammunition.

In industry the device promises to have a wide and most useful significance. The starting of diesel engines ranging from the small hand-start types and the powerful models started by compressed air has been described as a potentially fruitful field of application. In I.C.I. research laboratories, for example, multi-cylinder stationary models up to 85 h.p. have been started by this means.

Among diverse applications to which the power cartridge has been adapted can be mentioned the launching of torpedoes, re-cocking of extremely powerful springs, and the pressurising of fire extinguishers. In the latter connection it is of particular interest that the cartridge for an extinguisher costs less than half that of a soda acid refill, and about one-seventh that of a carbon dioxide unit.

In forecasting expanding uses for the device, I.C.I.—to whom most of the credit for its development must be accorded—leave it to engineers and plant designers, with their intimate knowledge of power requirements, to seek further fields not yet examined by those responsible for its present stage of development. I.C.I. is anxious to co-operate with them.

### I.C.I. Saves £10,000 p.a. Results of Heat Recovery at One Plant

**C**ONVINCING evidence of the large savings which an intensive application of heat recovery methods can produce has lately been provided by the co-operation of I.C.I., Ltd., with the Ministry of Fuel journal *Fuel Efficiency News*. This, reviewing what has been done at one of the larger I.C.I. boiler installations which had been in operation for some years and was regarded as entirely efficient, reveals that a reduction of approximately 5800 tons of coal per annum has now been achieved, the financial benefit for a capital outlay of £5000 being in the region of £10,000 per annum.

#### Four Main Savings

These savings have resulted from:—

(a) Heat and condensate rejected to turbine jet condensers and previously dissipated over a cooling tower is now recovered in cold boiler feedwater.

(b) Recovery of heat and water from high pressure turbine gland-sealing steam which was previously rejected to waste.

(c) Recovery of water, heat, and water conditioning chemicals from the continuous blowdown from the H.P. boilers, the discharge from the feedwater heater, which previously went to drain, being now diverted into the feed system of the I.P. boilers.

(d) Recovery of steam and condensate from sundry traps and drains, also recovery of heat and water from alternator air coolers, and coolers for steam and blow-down conductivity meters.



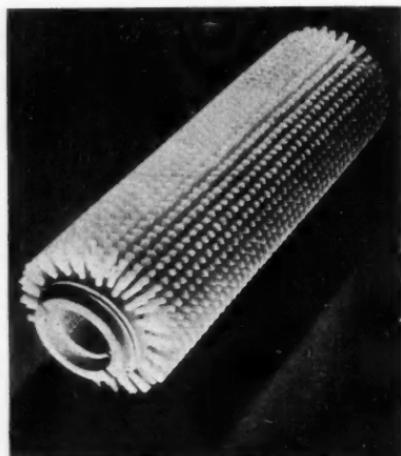
A 2-gall. fire extinguisher and the cartridge and firing assembly which operate it

# THE WIDENING FIELD FOR NYLON

## Tough Monofilaments Required for Industrial Brushes

by MALCOLM DUNCAN

DURING the war, the scarcity of natural bristles focused attention on the claims of nylon monofilament for industrial brushes. Since then, experience gained in the use of nylon brushes in many different trades has shown that for the majority of applications involving severe conditions of service they can give better



**Nylon furnisher brush as used in the textile industry**

and longer service than those made of animal or vegetable fibres.

To appreciate fully the advantages and potentialities of nylon monofilament for industrial brushes it is necessary to consider briefly the outstanding properties of the polyamide.

The monofilament is very strong, extremely tough and possesses an outstandingly good resistance to abrasion. This enables nylon tufted brushes to give long and efficient service without shedding any filaments. For many industrial applications, particularly in the food processing trades, the presence of loose filaments can be highly objectionable.

Nylon monofilament has been shown to retain its stiffness longer than natural bristle when immersed in water, oil and various kinds of processing solutions containing chemicals. Although wetting reduces the stiffness of a nylon brush, several hours are needed to reach equilibrium, and

a few moments' immersion in water will have but little effect on stiffness. A natural bristle of similar diameter loses its stiffness on wetting much more quickly.

For many industrial applications, particularly in polishing and buffing operations, the ability of the brush to recover its shape quickly after deformation is most important. Nylon shows a recovery of 93-95 per cent, which is superior to natural bristle, and the fatigue resistance of the synthetic fibre is much higher than that of animal or vegetable fibre.

Nylon is not damaged by boiling water and brushes may, therefore, be heat sterilised without risk of softening or injury to the brush. The smooth rod-like formation of the monofil facilitates cleaning and where nylon brushes are used in the food and textile industries it is a simple and quick operation to wash the brushes free from food particles, pigments, etc.

### Wide Chemical Inertness

The general inertness of nylon to a large number of chemicals, including weak solutions of organic and inorganic acids and alkalis, fits it especially for use where ordinary brushes are not practicable. Chemicals, such as sodium cyanide, normally injurious to natural fibres, have no deleterious effect on nylon. A 10 per cent solution of sodium cyanide did not affect nylon which was immersed in it for seven days. Similarly, hydrogen peroxide, sodium perborate and trisodium phosphate also produced no ill effects.

As the monofilament is a pure synthetic product it can be produced with a guaranteed diameter and degree of stiffness, the diameter for the usual 15-in. strands varying from 0.005 to 0.024 rising by 0.001 in. The close control over diameter, and therefore, of stiffness is of considerable importance as it facilitates the production of any number of brushes to a definite specification laid down by the user.

The ageing properties of nylon are superior to those of natural fibres and there is no noticeable inclination towards discolouration through oxidation. Only at temperatures above 100°C. and in the presence of air does nylon show any yellowing.

The main applications now being found for nylon brushes in British industry are in the food, textile, paper, metal and dry-cleaning trades. In flour milling and confectionery considerable use is being made

of nylon both for mechanically operated brushes, such as flour sieving, and small hand brushes, such as oven brushes used by bakers. In jam and marmalade manufacture nylon brushes are of considerable value when installed in various kinds of fruit pulping machines; here the retention of a high degree of stiffness over long periods of use ensures a high pulping efficiency.

In the textile industry the nylon furnisher brush has long since passed the development stage and is universally adopted for calico printing. The qualities which have made it so acceptable for this purpose are retention of stiffness under difficult working conditions, ease of cleaning down after a run in one colour, and non-shedding of filaments. The wool trade is also finding nylon brushes of value, particularly for wool combing, tiering and hank sizing. The presence of oils, starches and other dressing compounds has a much less marked effect on the stiffness of the monofilaments than is usually experienced with natural fibres.

The paper trade employs large-scale brushes which are required to withstand heavy service, for example in the manufacture of wallpaper, large nylon tufted brushes are now being used to carry the colour to the engraved rollers for printing the paper. For all such purposes the toughness of nylon, particularly its ability to resist fraying, splitting and shedding is of great importance.

There are a number of brush-using processes in the metal and engineering trades, particularly for the buffing and polishing of silverware and chromium plated goods. Nylon buffing and polishing wheels are proving very successful for such purposes and

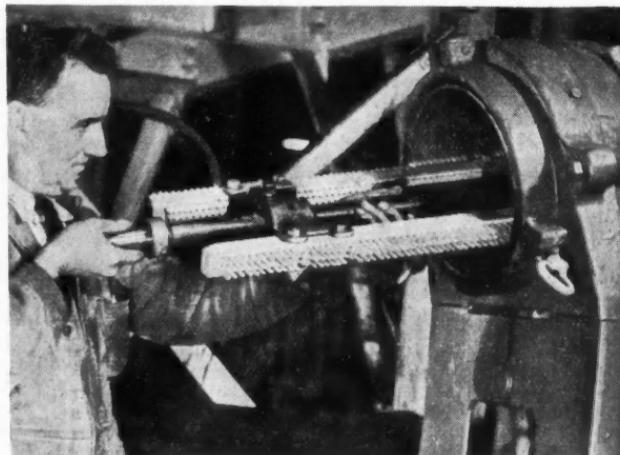
have a long life owing to the ease with which the monofilaments recover after being bent and twisted during the working of the machine. Polishing wheels made up of nylon tufted brushes are also coming into use in the shoe trade.

Among the new applications now being found for nylon brushes in Great Britain mention should be made of their use in plate glass cleaning machines. The monofilaments exercise a thorough scrubbing action and yet do not scratch the surface of the glass.

In American industry probably greater use is being made of nylon tufted brushes than in this country. Brushes are now successfully employed in the U.S.A. for bottle washing in the brewing and dairy industries, in sewerage disposal for removing refuse from filter screens, in vacuum sweeping devices as high speed vacuum sweeper brushes and in porcelain enamel and electroplating processes.

The future of nylon tufted brushes is certainly most promising, particularly when new types of polyamides become available for making into monofilaments and are able to offer industry a very wide range of physical and chemical properties.

There are still several quite important applications in which the present British polymer is unable to give complete satisfaction and it is known that modified polymers could give the extra resilience or fatigue resistance required. As it is, a steady expansion of the use of nylon monofilament for heavy duty industrial brushes is taking place as a result of the success which has already been achieved by this material.



Nylon brush in use in fruit pulping machine where the continued rigidity of the monofilament makes possible fully efficient scouring of cutting surfaces

(Photographs by courtesy of Webb & Foulger (Brush Manufacturers) Ltd.)

## Recovery of Wax from Sugar Cane

### Big Potential Supplies for Industrial Use

**B**EARING in mind the acute shortage of vegetable waxes in this and many other countries, the possibility of applying the results of former studies of wax recovery from sugar cane has acquired a new interest. It is now being recalled that in Natal for some eight years during and after World War I one plant was producing wax from this source, amounting in 1924 to some 6000 tons annually. This is one of the significant facts recalled by Mr. T. Swann Harding in a recent issue of *Amer. Jour. Pharm.*

Recent work, he states, has disclosed that 2.3 lb. of crude wax can be obtained per ton of sugar cane stalks, which is not an economic proposition. But the wax is much more concentrated in the waste filter press cake after the cane is crushed, and the juice clarified. The press cake, which is normally used as fertiliser, would be even more valuable for that purpose if the wax were removed, while the wax could be put to good use in the manufacture of polishes and related products instead of being wasted as at present. Wax recovery from press cake is said to range from 3-19 per cent according to cane variety and processing method.

#### Possible Yields

Nearly nine tons of air-dry press cake remain behind after a thousand tons of sugarcane have been processed. From this there can be recovered 1600 lb. of crude wax which yields 1120 lb. of dark hard wax (850 lb. when fully refined) and about 270 lb. of "pitch." In addition, there can be separated from the crude wax a fatty frac-

tion weighing 480 lb. which yields a wide variety of complex compounds of useful application industrially.

The process requires the use of acetone and alcohol as solvents to separate the wax from the fatty matter. It is estimated that the cost of recovery in America would not exceed 6d. (nine or ten cents) per lb. This would make sale at 9d. (14-15 cents) profitable, and that is well within the price range of similar waxes.

The value of sugar cane wax is enhanced by its hardness. When purified it is pale yellow to dark brown. It melts at 74-80°C. and has a specific gravity just under 1. It compares favourably with other vegetable waxes in hardness, and yields a clear liquid on melting.

#### Auxiliary Industry

Research continues in the transformation of this waste material into a valuable co-product of sugar from sugarcane. Large sugar mills would find it both practicable and profitable to process their own press cake and to develop wax recovery at a centralised plant operating the year round on dried press cake from many sugar mills.

The products would include an extracted press cake with improved fertiliser value; a hard wax refined to such degree as was necessary for the intended use; by-products from the fatty fraction; and the dark wax or "pitch." While the last two items are still of speculative value, they have interesting possibilities inviting further research. For instance, the sterols from the fatty fraction might prove useful in both the vitamin and the cosmetic fields.

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## SCOTTISH FERTILISER SUPPLY AND PRODUCTION

**A**N increase in supplies of potash fertiliser to Scottish users is expected, following recent representations made by the Highland and Agricultural Society to the Department of Agriculture. The department has revealed in a letter to the society, that a target of 165,000 tons was decided upon by the Ministry in late 1947, when it was doubtful if plans for the importation of 190,000 tons of potash would mature. By November 1947 deliveries to Scottish merchants totalled 22,300 tons, exceeding by 850 tons Scotland's allocation for the current fertiliser year. A further 4000 tons was agreed on in January of this year, to reach merchants before the end of February. This would bring Scotland's share to approximately 16 per cent of the total United Kingdom allocation, and a

further increase to 19.5 per cent would be made should imports be increased this year.

#### Perth Fertiliser Scheme

Plans are now being prepared by Perth fertiliser concerns greatly to expand the trade in chemicals and fertilisers in the city. Sites have been selected in the Lower Harbour area on the river Tay where two new factories will be erected immediately authority is given. It is anticipated that a very considerable increase in the amount of foreign trade done by the town will result. The intention is to import cargoes at Perth harbour, and to expand the industry on the adjacent site. There is already one large chemical manufacturing plant in the area.

# FRENCH OILSEEDS INDUSTRY—III

## Progressive Policy in Soap and Detergents

By a Special Correspondent

THE accompanying diagram of the Hansa-Mühle extractor, of the kind built by Bamag in this country, shows the endless chain of buckets, moving in a vertical direction inside an enclosed housing. At the bottom of each bucket is a nozzle through which miscella is sprayed to the next bucket below. Fresh solvent is injected on to the bucket which is due for discharge. Half miscella collects at the bottom of the extractor whence it is pumped again to the top, and brought in contact with a freshly charged bucket. Here the half miscella percolates through a series of buckets, to emerge as full miscella. After filtering, this is concentrated in two steps and finally stripped in a column fitted with plates by means of ascending steam. The meal is freed of solvent in a system of jacketed horizontal tubes, which can be operated under vacuum. In the last tube the moisture content of the extracted meal is adjusted.

A newly developed extractor is the de Smet of which the prototype operates in Antwerp.

The first is shortly to operate in a factory north of Paris. It consists essentially of a horizontal endless belt, inside a solvent-proof housing. Raw material is fed on to one end of the belt and by the time it has reached the opposite end, the material is extracted. This is achieved by sprays which are fed by seven synchronised pumps. The method by which the meal is dried and the miscella concentrated resembles that of the Hansa-Mühle extractor.

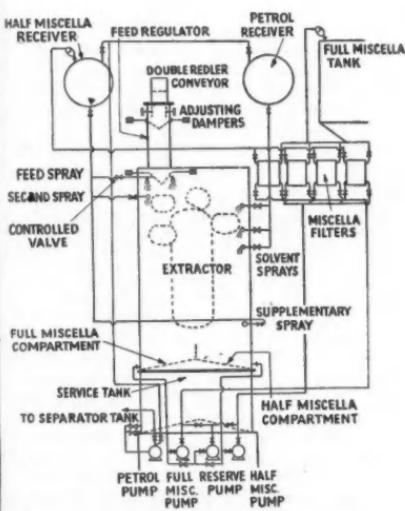
### Gum Removal

An operation which about a decade ago was rarely practised in France is the degumming of crude oils. Whether this is due to the increasing popularity of solvent extracting oils, recognition that de-gumming facilitates neutralisation, the good market for recovered by-products such as lecithin, or the able salesmanship of the plant manufacturers, it is true to say that the removal of gummy and mucilaginous material from the crude oil prior to further treatment is becoming accepted practice. This process is usually carried out by adding warm water or solutions of weak alkali such as sodium carbonate or trisodium phosphate to the oil and by separating it by means of a Sharples or Alfa-Laval centrifuge, having thoroughly mixed the charge at a slightly elevated temperature.

Neutralisation of the oil is usually carried out by the traditional kettle method in France but elsewhere horizontal closed vessels are more often employed. In recent years several continuous refining plants have been installed. These work on the American Clayton principle, and are likely to be adopted by the large companies in future.

After neutralisation the oil is bleached by an absorbent earth or activated carbon. With high quality oils this step has been bypassed in recent years to save the oil lost in the bleaching process. A slight colouring for certain oils is in fact quite desirable. On the other hand, it should be borne in mind that most edible oils on the market are hydrogenated, and thus have already been subjected to a marked bleaching of the fat. To reduce oil losses, some firms warm compressed air through the filterpress.

The final step of the treatment of oils for culinary purposes is deodorisation. This is generally achieved by batch plant. There is a general tendency to operate at higher vacuum and higher temperatures, and to use injection steam superheated to about 250°C.



Diagrammatic representation of the process employed in the Hansa-Mühle extractor

There is some development work going on with the aim of producing a continuous process and it appears that at least one group of research workers is very near to the realisation of a continuous hydrogenation plant. They claim that altogether new principles are involved, which would cut reaction time to a fraction of that of the present hydrogenation operation.

### Soap and Detergents

The manufacture of soap in France, has always been an important branch of the oils and fats industry. While hundreds of small soap boilers continue to operate the ancient soap kettles, the more progressive soap manufacturers and particularly the larger companies are determined to secure at the first opportunity new continuous plant in anticipation of the day when an abundant supply of raw material will allow them again to produce at full capacity. Great interest is shown in foreign fat-splitting and fatty acid distillation plant but a continuous soapmaking process developed by the Monsavon research group deserves special mention, because it is a good example of French ingenuity and originality.

The process can be divided into three phases: saponification, purification or washing, adjustment of pH. The (liquefied) fat and the caustic soda solution are pumped in pre-determined proportions through a high-speed pre-mixer and then to a premier mill, where the mixture is homogenised. The emulsion then passes through a jacketed vertical tube, where saponification is carried out and the curd leaves with a free alkali content of about 0.2 per cent.

### Glycerine Removal

In the next stage glycerine is washed out, the saponified mass being treated in a column (6 m. high, 80 cm. diameter for an output of 2500-3000 Kgs. per hr.) which is divided into four chambers, one above the other and each fitted with a high speed stirrer fixed horizontally through the column wall. Washing is carried out in countercurrent with salt water followed with a caustic soda solution. In the last stage excess alkali is neutralised by adding a small calculated amount of coconut oil, rosin, etc.

The advantages of this process are that glycerine water containing about 20 per cent glycerine is obtained; factory space occupied by the plant is small (a 50-ton per 24 hour plant occupies only m. x 8 m. x 8 m.); only one operator is required; steam consumption is negligible, but power consumption is somewhat higher than with the kettle process. A good quality soap is obtained<sup>12</sup>.

Pilot plant results have been successful and

one of the first large-scale plants is to be erected soon.

In this connection mention should be made of the synthetic detergent industry, which was given great impetus during and since the war, as raw materials for soaps dwindled. Whereas in this country and the U.S.A. a considerable proportion of the synthetic detergent industry is supplied by the petroleum refineries, synthetic detergents in France are based to a very large extent on chemicals and oil derivatives. Space does not permit a full-scale study of this industry, but the following list of some of the more important types of oil-based synthetic detergents, including one typical commercial example, may be of interest: sulphonated monoglycerides of fatty acids (Artic Synthex M), quaternary ammonium bases (Cetavlon), sodium oleyliso-thionates (Igepon A), sodium salts of oleyl methyl taurine (Igepon T), sulphonated alkyl benzimidazoles (Ultravons), sulphonacetates of fatty alcohols (Nacconol), sulphonated fatty alcohols (Gardinols), polyglycol esters of fatty alcohols (Emulphor)<sup>13</sup>.

These detergents and other preparations derived from coal carbonisation by-products are used in very large quantities in the highly developed French shampoo, skinfood, tooth-paste, lipstick, bath-salt and similar industries.

### Animal Fats

No mention has yet been made of animal fats which are, of course, integral to any picture of the French oil and fats industry. It is almost impossible to obtain a clear picture of domestic production, since no regular statistical data was collected before the war. An approximate estimate for the year 1938 is given in the accompanying table, together with the amounts collected by the authorities during the war years. It should, however, be remembered that not all the fats produced were surrendered, and the figures for the years 1941-45 are those for fats actually collected and not for total production.

Animal fat imports into France were never of great importance and totalled about 12,000 tons per annum in the years prior to 1939. About half of these were whale and fish oils, the rest mainly tallow and lard.

Much more could be said about the interesting and progressive branch of the vegetable oil industry and equally about tallow rendering, steaming manufacture, fatty acid distillation, candle making and many other branches of the industry. Generally, it may be said that the French oils and fats industry is developing fast, is highly active and exhibits

(Continued at foot of facing page)

# DEVELOPING "FLUIDISED BEDS"

## U.S. Study of Gas-Solid Processes

ONE of the most widely-used methods employed at the present time to bring about intimate contact between a gas and a solid is to pass the appropriate gas through a bed of the solid material. The name "fixed bed" was applied to this method since there was no movement of the solid particles within the bed. Examples of this method which can be cited could include the production of heating gases, the blast furnace production of metals as well as gas phase reactions which are catalysed by solids. A most useful survey of the basic principles and some recent developments of the system was contained in the paper contributed at the recent meeting in New Orleans of the American Institute of Chemical Engineers.

The recent development of fluidised beds by the petroleum industry has placed new emphasis upon a hitherto little-used method for contacting solids and gases. In the fluidised bed the gas is passed upwards through a bed of powdered material at such velocity that the bed becomes agitated and a violent motion of particles within the state is achieved. When in this "fluidised" state the bed closely resembles a boiling liquid in appearance.

### Material Transference

One of the primary purposes of contacting a solid with a gas is to effect the transfer of a material from the solid to the gas or from the gas to the solid, with or without the intervention of a catalyst.

The investigation reported in this paper was undertaken to determine the material or mass transfer characteristics of fluidised beds. In order to obtain the desired data,

beds of powdered naphthalene were fluidised with three gases—air, carbon dioxide and hydrogen. As the fluidisation proceeded, some of the naphthalene vaporised from the bed. By determining the rate of vaporisation of the naphthalene, the gas flow rate, and the properties of the bed, it was then possible to determine the mass transfer characteristics of the fluidised bed.

### Two Types

During the course of the investigation it was noted that two types of fluidisation were obtained. "Bubbling fluidisation" was characterised by a gentle bubbling action in the bed as the gas passed upward through it. With higher gas velocities the bubbling action became more violent until finally slugs or streams of material were lifted from the surface of the bed. This latter type of action was termed "streaming fluidisation."

In order to correlate the mass transfer data obtained several dimensionless groupings of the variables were employed. Separate correlations were obtained for the bubbling and streaming fluidisation regions. The dimensionless groups employed were the Reynolds number, the Schmidt number, a  $J_d$ -factor and theta, which is the product of the Reynolds number and the square of the drag coefficient for a particle in free settling.

Mass transfer data of the type reported here are essential to a complete understanding of the mass transfer phenomenon and are also valuable in the study of gas phase reactions catalysed by solid materials. Mass transfer data are also required for design purposes.

### FRENCH OILSEEDS INDUSTRY—III

(Continued from previous page)

an exceptionally progressive outlook and willingness to modernise and improve processes and products undeterred by difficult circumstances. (Concluded)

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### APPROXIMATE PRODUCTION OF ANIMAL FATS (TONS)

	1938	1941	1942	1943	1944	1945
Butter	210,000	130,000	125,000	147,000	99,000	88,000
Edible tallow*	30,000	4,950	8,096	4,308	2,661	3,705
Industrial tallow	60,000	6,434	7,750	4,152	1,996	2,673
Lard	60,000					

\* Expressed as rendered tallow.

## SOUTH AFRICAN CHEMICAL INDUSTRY

A NUMBER of improvements have been included in a new industrial agreement between workers and employers in the chemical and explosives industry. The agreement, which provides for a general increase in wages varying with the different categories of workers, was reached by representatives of African Explosives and Chemical Industries, Ltd., Cape Explosives, Ltd., and the eight trade unions concerned, after two days' conference in Johannesburg. It will be effective for three years from the date to be fixed by the Minister of Labour. A number of former indirect benefits have been consolidated into the basic wage, giving all workers at least 3d. an hour more in addition to the general increase granted. The industry will operate on a 46-hour week under "closed shop" conditions. Workers in the Transvaal will receive three weeks paid leave and a holiday bonus of £12 10s. and workers in the Cape two weeks and £3. Annual leave will be increased in the Cape to four weeks after 20 years' service, long service allowances will be paid and free medical attention will be provided.

\* \* \*

A scheme to establish a chain of seven soap factories from Boksburg to Cairo was announced in Johannesburg by a director of Lever Brothers. The new factories are to be at Boksburg, Dar-es-Salaam, Kampala (Uganda), Cairo and in West Africa. The Boksburg factory will stand on 40 acres and, with plant, will cost £1 million, and will employ more than 1000.

\* \* \*

Large deposits of torbanite suitable for the economic production of crude oil are reported in the Wakkerstroom district of the Transvaal. Assay values compare favourably with the torbanite being worked by a company at Ermelo. The formations occur at relatively shallow depths. The average width of the torbanite seam is nearly 30 in., and the mineral yields from 31 to 52 gallons of crude oil to a ton. The area investigated so far is estimated to contain 3,672 million tons of torbanite, and 1,224 million tons of oil-impregnated sandstone. Underlying the torbanite are a number of coal seams, most of which yield crude oil in economic quantities. Water for the retorts could be obtained from the Assegai River, which runs nearby. The present production of crude oil from torbanite is approximately 1.8 million gallons a year; shortage of plant is holding up further expansion.

\* \* \*

The world's largest deposits of vermiculite, have been discovered in the Northern

Transvaal, at Palabora, some five miles from the Kruger National Park. An inland lake of vermiculite, ringed by hills of granite, covers about 7 sq. miles and is believed to contain more than 25 million tons of the ore. Within a year a production of between 350,000 and 400,000 tons annually is expected from these deposits. The bulk of the output will go to the United States, and an American expert said that the ore in the Transvaal is of a higher grade than that mined in America. It can be raised by African labour at about 5 per cent of the American cost—roughly £5 per ton f.o.b. at Lourenco Marques.

\* \* \*

The cut in South Africa's oil and fat allocation by the International Emergency Food Council should not cause a serious soap shortage in the Union, it was stated in authoritative circles. The allocation is reduced from 60,000 tons to 24,000 tons, but the allocation of 60,000 tons was 20,000 tons more than was actually received in 1947. South Africa's groundnut supplies for 1948 are estimated at 60,000 short tons, against 23,000 tons last year. Moreover, South Africa has now added facilities for hardening whale-oil for use for soap and other purposes.

\* \* \*

The chairman of a South African paint manufacturers' association, has said that there is no justification for the high prices demanded by South American linseed oil producers, who were taking advantage of the acute demand. The quotations for linseed oil have increased almost monthly. Before the war, linseed oil cost 2s. 3d. a gallon. It is now in the neighbourhood of 21. Conditional selling was said to be a feature of certain Argentine oil transactions, the Argentine Government stipulating that a quota of the less economic linseed oil cake must be accepted with the oil. The price of other paint ingredients had also risen, but not to anything like the same extent. The shortages of white pigments and of containers were acute.

\* \* \*

The Federated Chamber of Industries made representations to the Government for a partial removal of export control, but the Government states that it is not yet willing to leave to the discretion of manufacturers the export of goods made from controlled materials. It is promised that when certain manufacturers feel their interests are prejudiced, efforts will be made to reduce the restrictions.

# WORLD SULPHUR AND PYRITES

## Review of Occurrence and Recovery Methods

**S**ULPHUR occurs in the native state and is mined as such. It is found near most volcanoes, especially where gases are escaping, in spring deposits with gypsum and travertine, and in sedimentary beds of limestone and gypsum. Small amounts of sulphur occur in mineral veins and coal beds.

The world's largest deposits are found in the United States and Sicily. The latter cover more than 800 square kilometres and vary greatly in richness. The sulphur is massive and crystalline and is accompanied by celestite, barite, gypsum and calcite. The ore range from 8 to 50 per cent. sulphur. Most of the mining used to be done by hand, the sulphur being recovered by setting fire to a pile of ore and allowing the heat of the burning sulphur to melt the remainder. During the past 20 years less primitive methods have been introduced.

The most important sulphur deposits in the United States are those of Texas and Louisiana. The Texas deposits occur in connection with the salt domes of the coastal region, individual deposits ranging from 200 to 1500 acres or more in extent. The sulphur-bearing beds are from 100 to 150 feet thick and the sulphur content varies from 10 to 50 per cent. Most of the present production comes from depths of 700 to 850 feet, but some deposits are known to extend 1200 feet below the surface.

### Frasch Method

In 1865 sulphur was discovered in Calcasieu Parish, Louisiana, but all attempts at mining failed on account of the overlying quicksands until Frasch perfected his hot-water method in 1904. In this method of extraction the sulphur is carried upward by air under pressure. When the melted sulphur reaches the surface it is piped to the stock piles, where it emerges as a red liquid which spreads out in a thin layer, cools rapidly and becomes yellow. A retaining wall surrounds the top of the stock pile and is raised from time to time as the level of sulphur rises, until there is a huge block of solid sulphur 60 feet or more in height. Some stock piles are as much as 300 feet wide and over a quarter of a mile long. The sulphur obtained by this method is 99.5 per cent. pure and ready for direct use.

After the introduction of the Frasch system, the Calcasieu deposits were extensively worked, yielding 10 million tons of pure sulphur before their exhaustion in 1924.

The Frasch method of producing sulphur rendered the United States entirely inde-

pendent of Sicily, from which practically all its requirements had previously been imported. Today the United States is by far the world's largest producer and exporter. In 1937, with an output of 138,283 tons, Japan was the third largest producer of native sulphur.

Attempts have been made to extract elemental sulphur from the enormous reserves of sour natural gas available in South-West Arkansas, where removal of the sulphur has the additional advantage of improving the quality and value of the fuel gas itself.

Most of the elemental sulphur recovered from gas purification is marketed as a paste containing 37 to 50 per cent. sulphur, or as dried relatively pure sulphur. The fine particle size of this material makes it valuable as a fungicide and insecticide. Sulphur may also be removed from fuel gases in the form of hydrogen sulphide, most of which is either converted into sulphuric acid or burned as fuel.

### South America

Argentina has taken measures intended to achieve self-sufficiency in the relatively near future. In August, 1943, the Government formed a mixed corporation with Compania Azufrera Argentina S.A., the principal Argentine sulphur producer, the intention being to enlarge the present refining capacity of 12,000 tons a year sufficiently to supply the entire domestic consumption, said to be about 30,000 tons annually.

More than 220 sulphur properties have been listed in Chile, which has an output of about 30,000 long tons a year. Sulphur has been produced in Mexico for several hundred years, but the industry has never been very large, the greatest annual output on record being 9600 tons in 1912. At present, approximately 300 to 400 tons of crude sulphur are produced monthly, largely from the vicinity of Mexicali in Northern Lower California. Spain is self-sufficient in elemental sulphur, some 5000 tons of native sulphur being produced annually, while the Rio Tinto Co., of Huelva, has a yearly output of 27,000 tons derived from pyrites processed by the Orkla method. Other producers include Bolivia, the Netherlands East Indies, Palestine, Peru and Turkey.

The treatment of copper and zinc ores yields large quantities of sulphur, which are recovered at the mills as pyrites concentrates or at the smelters as sulphuric acid or elemental sulphur. In smelting copper and zinc

(Continued overleaf)

## German Phthalic Anhydride

Report on I. G. Farben Procedure

**M**ANUFACTURING processes and catalysts used in the production of phthalic anhydride from naphthalene, and the production of aniline by hydrogen reduction of nitrobenzene at the I. G. Farbenindustrie plant, Ludwigshafen, Germany, are described in a report placed on sale by the Office of Technical Services, U.S. Department of Commerce. Following investigations carried on in Germany under the sponsorship of the Office of Technical Services, R. W. Nash, engineer of E. I. Du Pont de Nemours & Co., and F. J. Bauman and H. M. Trammell, of Celanese Corporation, Rome, Georgia, prepared the report, which reveals, *inter alia*, that the durability of the catalyst for making phthalic anhydride results in low maintenance and replacement costs and the catalytic process used in making aniline is superior in many respects to the iron process.

The authors note several outstanding and significant facts in connection with the I. G. Farben phthalic anhydride and aniline technology. The vanadium pentoxide catalyst used in the manufacture of phthalic anhydride has a life of over 10 years. The operation of the phthalic anhydride converter is simplified by the use of molten

**WORLD SULPHUR** (Continued from page 401)

concentrates, sulphur is driven off as a constituent of gases, principally sulphur dioxide, which are used in the manufacture of sulphuric acid at many smelters.

The recovery of sulphur or sulphur compounds from coke-oven, refinery, still, natural and fuel gases is receiving increasing attention. In many countries these processes are encouraged as a step towards self-sufficiency, while the United States regards them as a means of profitably utilising a waste product or of conserving natural resources.

### Pyrites

Pyrites, a mineral of widespread occurrence, is an iron sulphide,  $FeS_2$ , containing 53.4 per cent sulphur and 46.6 per cent iron.

Deposits containing millions of tons of pyrites are known, the most notable being those of Spain. The pyrite belt in the provinces of Huelva and Seville is 80 miles long and 25 miles wide. The most famous mines are those on the coast near Rio Tinto, 30 miles from the city of Huelva. Estimates of the reserves range from 300 million to 1,000 million tons, and the estimated life of the mines at the present rate of production is

salts as a cooling medium. (The salts are cooled by air.) The treatment of the catalyst used for aniline manufacture with copper salts at the end of nine months' use extends the useful life of the catalyst to one year. The catalytic process for production of aniline is cleaner and safer than the method using iron.

Vanadium pentoxide is the active substance in the catalyst for phthalic anhydride with silica and potassium sulphate as the carriers. The method of preparing it, the size of the catalyst tubes, and the air pressure used, are discussed in the 17-page report. The process for the manufacture of aniline is similarly discussed, and provides data on temperature and pressures, converters, catalyst composition and method of mixing, and reactivation of the catalyst.

A drawing of the phthalic anhydride converter, a flow chart of the phthalic anhydride process, and a schematic diagram of aniline production are included in the report (No. PB-81279, "Catalysts for the Manufacture of Phthalic Anhydride and Aniline," I. G. Farbenindustrie, A.G., Ludwigshafen. Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C., 50 cents).

100 years. The ore runs from 48 to 51 per cent sulphur.

With an output approaching one million tons, derived chiefly from cupriferous ore-bodies in the Urals and from coal mines, the U.S.S.R. has become one of the leading pyrites producers.

On account of the low value of pyrites, a deposit must be readily accessible both for mining and marketing to be worth developing. Virtually the only use of pyrites is in the production of sulphuric acid. About two tons of high-grade pyrites is required to make as much sulphuric acid as one ton of sulphur.

### South African Production

There is but little native sulphur of commercial importance in South Africa. Pyritic concentrates are recovered, however, as a by-product, the West Rand Consolidated Mines being at present the principal producer. The entire output, which last year amounted to 41,936 tons, is sold to the manufacturers of sulphuric acid.

[*South African Mining and Engineering Journal.*]

## Technical Publications

THE extent to which World War II affected production and distribution of technical and scientific publications in this country is generally well known—they managed to rub along with a greatly reduced paper allocation. In Germany, however, a number of valuable publications were suspended, among them *Spectrochimica Acta*, an international review which enjoyed wide circulation here. Its field is the application of spectroscopy to chemical problems, particularly those relating to qualitative and quantitative analyses by means of ultraviolet, visible and infra-red emission and absorption spectra. Notice has now been received that the review has been resurrected—with the material assistance of Pope Pius XII—and Volume III, part 1, produced in the Vatican City, is now available price 16s. 11d. post free from Adam Hilger, Ltd., London.

\* \* \*

The measure of a nation's scientific progress, and by inference, its industrial development, can be assessed by the quality and quantity of its scientific publications. In pre-war years, the leading countries were the U.S.A., Great Britain, Germany, and the U.S.S.R. in that order, though unrestricted access to those of the last-mentioned could be had only partially and with difficulty. In proportion to the size of its population, British scientific literature had strong claims to leadership, and judged by current showing, and despite paper rationing, is still a serious challenger. A good deal of credit must be given to commercial enterprises concerned with the manufacture of scientific equipment, at increasing number of which make a practice of publishing the results of research. An especially good example is "Philips Technical Review," of which Vol 9, No. 6, has just been released. Although published at Eindhoven, Holland, by N. V. Philips, the parent company, British scientists working in Philips' laboratories here make frequent contributions. The current issue, which contains five informative papers, including "A New Electron Microscope for 100 kV," "Improvements in the Construction of Cathode-Ray Tubes," and "Crystalline Structure of Ferrites and Analogous Metal Oxides," is obtainable from Philips Electrical, Ltd., Century House, Shaftesbury Avenue, W.C.2.

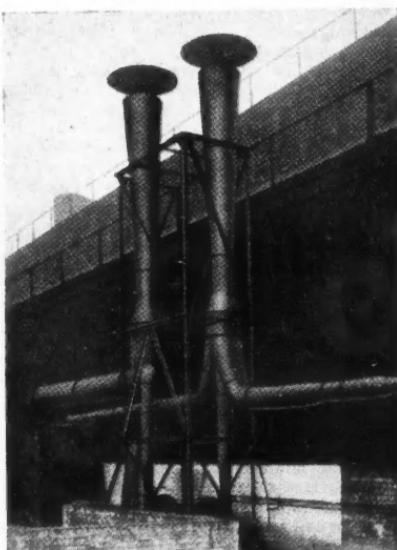
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The importance of the electric fan as a basis of an efficient ventilation system is underlined in the series of booklets now issued by Woods of Colchester, Ltd. The data and illustrations provided are welcome, in view of the fact that such fans

need to be carefully selected with an eye to performance and conditions of working. An interesting range of propeller fans (orthodox, flame-proof, etc.), is depicted.

\* \* \*

Elimination of fumes and dusts produced by industrial processes, even where it is not obligatory, customarily engage a good deal of attention from factory managements. The obligation to study the health of operatives is recognised, but there is another aspect of the fume problem which calls for equal consideration—the effect of attack on the equipment installed to deal with it. Ductwork can be coated with resistant paints, and is in any case normally replaceable without much difficulty, although not without considerable expense. Of still greater importance is the fan impeller, the sudden failure of which can cause irreparable harm, even if nothing worse than a production stoppage occurs. In this connection, special interest attaches to the ejector system in which the fan is in contact with air only and the venturi outside ejector principle. These are only two of a number of such methods amply illustrated and discussed in "Modern Dust Collection and Fume Removal," published by Visco Engineering Co., Ltd., Croydon.



Two Visco acid fume extraction plants, in which the fans do not come into contact with the corrosive vapours



## A CHEMIST'S

### BOOKSHELF

**Bayley's Chemists' Pocket Book.** Edited by F. G. Angell, B.Sc., Ph.D., F.R.I.C. London, 1948. E. & F. N. Spon, Ltd.; pp. VI + 501; 30s.

The experience of an editor of a chemistry reference work such as this completely falsifies the Latin tag about the permanence of the written word. Much of what was written shortly before the war and provided then an ample source of information for most scientific workers has latterly required to be greatly amplified or even excised and replaced. Gratifying as this is as evidence of the growth of classified and tabulated knowledge, it has imposed big responsibilities on editors, publishers and printers, calling for highly specialised work of a kind difficult and expensive to command. This tenth edition of the Pocket Book has, in fact, been entirely re-set and a great deal of it has been re-written to include the large body of information which has become available since its predecessor appeared. In the very extensive analytical section, for example, sugar, milk, beer, iron and steel and non-ferrous alloys, refractory and water softening materials have all been reviewed again. Elsewhere, new matter includes the international critical tables, the latest computation of atomic weights (excluding, however, the new elements associated with uranium), the table of azeotropes of common liquids, alcohol data and a great deal of new electrical information. As a wholly contemporary source of information the new Pocket Book will have a value out of all proportion to its price, substantial though that is. Its format is still fortunately of the convenient pocket size and its get-up is elegant and apparently durable.

**The Advancement of Science.** Vol. IV, No. 16. The British Association, Burlington House, London, W.1. IV + 107 pp., 6s. net.

Despite the fact that the contents of this welcome addition to the British Association series are a twice-told tale—first at the British Association annual meeting in Dundee in August-September 1947—they are as engrossing at second sight as they were then. The memorable commentaries on the several branches of science which were given then demand permanent record in fuller detail than

recollection provides, and many besides scientists will gladly add this volume to its predecessors. The general review of the Dundee meeting, "Swords into Ploughshares," is an admirable piece of condensation; the ten following papers reproduced in full offer some of the satisfaction afforded to those who heard them last autumn and provide a permanent record to which frequent reference is likely to be made. The papers symposia dealt with at length, in addition to the addendum to the presidential address by Sir Henry Dale, "Science in Peace," include: "Penicillin and Other Antibiotics" (Sir Howard Florey), "The Sense of Smell" (Prof. E. D. Adrian), "Petroleum Today and Tomorrow" (Dr. Kirtley F. Mather), "Camouflage" (Dr. Hugh B. Cott), "The Education of the Man of Science" (symposium), "Operational Research in War and Peace" (symposium), "Dating the Past" (Prof. F. E. Zeuner and Drs. K. Oakley and H. Godwin), "Developments in Scottish Forestry" (Mr. A. H. Gosling), "How Far Can Britain Feed Herself?" (Mr. Walter Elliot) and "Human Efficiency as Affected by Climate and its Relation to Social Development" (Prof. H. C. Bazett).

**How To Become A Pharmacist.** Wilfred H. Mutcham, M.P.S. London 1948. The Actinic Press IX + III; 5s.

Surveying the calm and dignity which clothes the Pharmaceutical Society of the present day it is not easy to credit that not greatly more than a century ago the profession which it represents and safeguards was engaged in lively and prolonged warfare with its rivals the physicians and the apothecaries which at times had many of the characteristics of a dog-fight. These "old unhappy far-off things" are recalled and reviewed in some detail in this book, which manages to survey in a short space all the fundamental information of an essentially practical sort which a young man should have before committing himself to the five or more years of disciplined study without financial recompense which, if he applies himself with sufficient singlemindedness, will entitle him to write Ph.C., or B.Pharm. and possibly M.P.S. after his name.

## Fresh Factors in Paint Chemistry

### New Tools and Changing Concepts

PROBLEMS connected with oil absorption and the advantageous application of scientific instruments and research methods in the paint and varnish industry were dealt with in two interesting lectures at Bristol recently.

On March 4 a combined meeting of the Bristol Section of the O.C.C.A. and the Bristol Section of the Society of Chemical Industry was held at The University, Bristol, when Mr. S. H. Bell, of the Paint Research Station, Teddington, lectured on "The Tools of Paint Research."

Mr. Bell developed his theme in terms of the use of research tools in fundamental studies of raw materials and finished products in the paint and varnish industry.

The manner of use of electron microscopy, electron diffraction analysis and X-ray crystal analysis in pigment studies was described in attempts to connect the colour differences between chemically similar pigment samples, with differences of crystal structure and habit, particle size and shape, etc.

#### Oils and Resins

On the organic side, reference was made to research on the oxidation and heat manipulation of drying oils, on the basic reactions involved in the development of oil-solubility in natural resins (as by the fusion process known as "running") and on the varnish making process. The research tools described included molecular distillation, adsorption analysis, low temperature crystallisation, solvent segregation, etc., for isolating spectroscopy and the monolayer technique for structural diagnosis.

Some of the limitations of the various research tools and some gaps in the range of available tools were indicated by reference to particular paint research problems, the satisfactory solution of which, in the scientific sense, will require increased knowledge of the molecular structure of oils and resins, of the crystal lattice defect structures of pigments, and of conditions and reactions at pigment/media interfaces.

#### Oil Absorption Data

At the sixth ordinary meeting of the Bristol Section of the O.C.C.A., Mr. E. Marsden gave a survey, in two parts, of "Oil Absorption."

The lecturer began by saying he was doubtful whether the British Standards Institute method of oil absorption really meant anything at all. When statistical analysis was applied to the results already

mentioned it became obvious that there were wide discrepancies between the figures obtained by different operators.

Within somewhat wide limits of experimental error, all the independent results were what would be expected when the method used to determine oil absorption tended to measure some specific property of the material, and there did not appear to be any evidence to support the theory that there was a variation in results when different surfaces were employed on which to carry out the estimation. No increase in accuracy was observed when the original tests were duplicated and the individual results were of little value. In addition, no one operator could get similar end points on two different pigments.

#### Related Characteristics

Summarising, in the second part of his paper, on recent advances in experimental work, Mr. Marsden said a new theory is proposed which shows oil absorption to be the sum of two quantities, first, an absorption factor, and second, an oil coating factor. Some substances show little adsorption. In these cases the total oil absorption is equal to the oil coating factor. Some substances have considerable adsorptions, and for these the greater the surface area the greater the adsorption and hence the oil absorption tests will compare by difference the greater or less particle sizes of two samples of the same pigment.

#### Barytes from Australia

BARYTES will shortly be exported from Australia to Great Britain for the first time since it has been produced in Australia. The first shipment will be of 100 tons.

Australia has developed an original line of research which enables the off-colour of low-grade minerals to be satisfactorily bleached. This is also expected to be an important factor in the development of production and export. South Australia, which is the chief producing State in the Dominion, has increased from 2470 tons in 1945 to 6106 tons last year. British manufacturers will now receive the high quality product which Australia has been shipping to the Near East. It is estimated that there are still 500,000 tons of the ore in South Australia. An extensive development programme is being undertaken by the S.A. Barytes, Ltd., at the Blinman Mines, South Australia.

## PERSONAL

MR. CLAUDE F. HOWARD, of Brentwood, chemical manufacturer, left £109,197.

MR. E. N. BRADLEY has been elected chairman of the Rubber Trade Association in succession to MR. J. C. BENNETT.

MR. A. J. JOHNSON has resigned from the chairmanship of the London Aluminium Co., Ltd., and vacated his seat on the board. MR. DUNCAN CAMPBELL acts in the dual rôle of chairman and managing director.

MR. WILLIAM H. JESSOP, The Wells, Fenay Bridge, Huddersfield, former principal of H. Jessop & Sons, Ltd., Fenay Bridge Chemical Works, left £114,027 (net £113,541).

MR. H. W. ROBINSON, librarian of the Royal Society, retires from that post on March 31 after discharging its functions since 1935. He joined the staff of the Society in 1902 and was promoted first to assistant, and then (in 1930) assistant librarian.

MR. PAUL REILLY will join the Council of Industrial Design at the end of March as public relations officer in charge of promotion and publicity. After war service in the Royal Armoured Corps and RNVR (Naval Intelligence Division) Mr. Reilly carried out for the technical Press a six months' survey of the American plastics industry.

Newly-elected chairman of Newcastle and North-East Coast Section of the Royal Institute of Chemistry, MR. W. GORDON CAREY, of Sunderland, has been public analyst for both Sunderland and Newcastle for the past eight years. In addition, he is analyst to Sunderland and South Shields Water Company, a post he has held since 1923 when he came to Wearside from London.

MR. KENNETH HORNE, sales director of Triplex Safety Glass Co., Ltd., responded to the toast, "The Visitors," at the third annual dinner of the St. Helens (Lanes) section of the Society of Glass Technology, held at the Fleece Hotel, St. Helens, on March 12. Mr. Horne is well-known for his "Much Binding" and other broadcasts, which he started as a hobby when in the R.A.F.

DR. CHAIM WEIZMANN, inventor of the Catarole process for the production of aromatic hydrocarbons, and olefins from petroleum, has received a public apology from Associated Newspapers for an erroneous report in *The Daily Mail* to the effect that he had been arrested in Palestine in connection with the activities of the Haganah

organisation. The newspaper undertook to pay a substantial sum to charity, and to indemnify Dr. Weizmann against costs.

### Obituary

PROF. E. WAYMOUTH REID, who was associated with some of the earliest experiments with X-rays in this country, in the course of which he was the first scientist in Britain to suffer from an X-ray burn, died this week at Edinburgh. He was 85.

SIR NIGEL CAMPBELL whose sudden death on March 4 has been announced, was a director of Glaxo Laboratories, Ltd., Greenford, having joined the board on January 3, 1947, and rendered valuable service to the company. He was well known in industrial and financial circles and was chairman of the committee to inquire into scrap and pig iron supplies (THE CHEMICAL AGE, March 13). His principal industrial connection was as chairman and managing director of the Triplex Safety Glass Co., Ltd. During the war Sir Nigel was Controller-General of munitions-production at the Ministry of Supply. His services earned him a knighthood, and later a K.B.E. He was a Crown Governor of the Imperial College of Science and Technology.

### REPAIRS AND TAXATION

THE National Union of Manufacturers has written to the Chancellor of the Exchequer thanking him for anticipating the forthcoming Finance Bill by announcing that, as the carrying out of repairs deferred from the EPT period might have to be postponed longer than was anticipated (as represented to him by the National Union), it was proposed to extend the time limit to March 31, 1952. The NUM states that it regards this as a valuable concession to industrialists since it will enable them to comply with the Chancellor's appeal to defer expenditure on work of any considerable nature.

### July-December Index

SOME copies of THE CHEMICAL AGE Editorial Index for July-December are still available. A copy will be sent on request to any subscriber who has not already received one.

## PARLIAMENTARY TOPICS

**Caustic Soda Prices.**—The price of caustic soda to be supplied by the U.K. to Argentina under the Andes Agreement, is to be negotiated through ordinary commercial channels.

**Coal Exports—Switzerland.**—Coal exports to Switzerland were resumed last month and it is expected that shipments in 1948 will amount to at least 100,000 tons.—Mr. H. T. Gaitskell.

**Lime Subsidies.**—Applications from farmers for the lime subsidy in 1946 and 1947 totalled 185,167 and 161,716 respectively. Subsidy values for the two periods were £2,780,600 and £2,632,430 respectively.—Mr. T. Williams.

**Chemicals for Leaf Spot.**—The practice of spraying certain varieties of Jamaican banana plants with chemicals has now become widespread. It is proving highly successful in controlling the spread of leaf spot disease.—Mr. Rees-Williams.

**Industrial Disputes—Coal.**—The number of days lost owing to industrial disputes in the coalmining industry between V.E. day and the end of February, 1948, was about 1½ million. In the 34 months from November, 1918 to August, 1921, 98 million days were lost.—Mr. G. A. Isaacs.

**China Clay.**—In order to help the china clay industry to expand its output and exports, it has recently received larger coal allocations, and is being assisted to build up its labour force. Shipping difficulties encountered are being discussed by the Board of Trade with the Ministry of Transport.—Mr. J. W. Belcher.

**Purchase Tax on Drugs.**—The estimated revenue from the purchase tax on drugs, disinfectants, medicines, toilet preparations and accessories is about £15 million per annum. The tax on these commodities will be reconsidered before the National Health Act is brought into force.—Sir Stafford Cripps.

**Iron and Steel Producers.**—In reply to a question last week, Mr. G. R. Strauss listed the number of U.K. undertakings engaged in the various sections of the iron and steel industry, indicating that the largest groups were: Drop forgings 189 firms; bolts, rivets, screws, etc., 183; light re-rolled products 124; steel castings 98; high-speed steel 94; wire 94.

**Bauxite in British Guiana.**—A licence to prospect for bauxite in the Pomeroon district of British Guiana has been granted to the Permanente Aluminium Corporation of California. If the investigations yield favourable results, the British Guiana Government will take steps to encourage the

local manufacture of alumina or aluminium.—Mr. Rees-Williams.

**Technical Documentation.**—Asked whether he would consider the advisability of publishing a periodical devoted to details of new ideas, inventions and methods published in the foreign technical press, Mr. Herbert Morrison said he was looking into the question, but it was his impression that the British trade and technical press coverage was adequate.

**Gas Boards May Make Plant.**—During discussion of the Gas Bill by the Standing Committee last week an Opposition amendment seeking to prevent area boards from manufacturing plant and fittings, or from selling, hiring or supplying gas plant, was defeated by 23 votes to 12. Mr. Hugh Gaitskell, Minister of Fuel, said it would be unfair to deny to the gas industry powers already held by the Central Electricity Authority.

**Capital Issues.**—The four largest aggregate capital issues approved by the Capital Issues Committee since August 1, 1945 (announced by Mr. Douglas Jay and classified under 14 industrial headings) were:—

Industry	Approximate totals £'000
Oil	110,211
Coal, iron and steel	68,360
Engineering and metal industries	57,379
Chemicals, drugs and dyes	24,765

**Festival of Britain, 1951.**—Mr. Herbert Morrison announced last week that a council is to be set up to supervise the arrangements for celebrating the centenary of the Great Exhibition, 1851—to be known as the Festival of Britain, 1951. General Lord Ismay is to serve in the honorary capacity of chairman, and Mr. Gerald Barry has been appointed the festival's director-general. Mr. Leonard Crainford is to be the secretary. The offices of the Festival of Britain will be at the Royal Society of Arts' headquarters, Adelphi, London, W.C.1.

**German Bizonal Steel Industry.**—The capacity of the electric furnaces to be retained in the bizonal area, and which are capable of producing stainless steel, is approximately 320,000 tons a year. Of the steel works declared available for reparations, only Krupps of Essen and Deutsche Edelstahlwerke of Krefeld were important producers of stainless steel. All existing capacity for finishing stainless steel will be retained; the cold rolling mills and finishing equipment for stainless steel sheets at the two works mentioned will be transferred to other plants which are to be retained. Figures for French and Soviet zones cannot be given.—Mr. E. Bevin.

## CANADIAN CHEMICAL PRICES

**F**OLLOWING a statement made on January 15 by the Canadian Minister of Finance, covering re-imposition of price ceilings on a number of basic commodities, the Wartime Prices and Trade Board has announced a drop in the price of certain types of fertilisers and basic chemical ingredients of compound fertilisers in Eastern Canada. The lower prices are already in effect. As a result of this other action, board officials state that the price of compound fertilisers, on which no formal ceiling is being set, will average about 8 per cent lower than the prices prevailing in the spring of 1947, despite the increased cost of materials imported from the United States and the discontinuance of fertiliser subsidies.

### Cheaper Fertiliser

Under the new price regulations, ammonium nitrate will cost maritime provinces farmers \$74.50 per ton, a reduction of \$16.50 from the high level established in September, 1947. Prices in Quebec and Ontario are being reduced by \$16.45 and \$12.45 per ton, respectively. The processor's price of cyanamid is being reduced from \$2.15 to \$1.80 per unit (20 units per ton) f.o.b., Niagara Falls. Prevailing prices of other fertiliser materials, on which no formal ceilings are being set, will be slightly above those prevailing a year ago. Superphosphate will cost the consumer 5 per cent more, muriate of potash 6 per cent to 8 per cent more, depending on freight charges, and the consumer price for sulphate of ammonia, will be about 13 per cent higher.

Canada's fastest growing industry was the manufacture of plastics, said Mr. J. H. McCready, of Montreal, president of the Canadian section of the Society of Plastics Industry, when he addressed the sixth annual international plastics conventions at Montreal last week. He reported that the estimated sales volume last year totalled \$48 million—seven times the pre-war figure. Another indication of the industry's growth was that more than 12,000 persons were employed in Canadian plastics manufacture to-day compared with 2500 in 1939.

### U.S. Chemicals for Europe

A U.S. Government sub-committee which has recently reported on the U.S. chemicals position in respect of European needs under the aid programme, has reported that some items might be in short supply.

Although specific chemical requirements for Europe are not mentioned in the report, total chemical demands on the U.S.A. from abroad during the current year are put at \$260 million, with U.S. chemical outputs running at about \$9 billion per year.

## NEXT WEEK'S EVENTS

SATURDAY, MARCH 20

**Electrodepositors' Technical Society** (Sheffield and N.E. Centre). Grand Hotel, Sheffield, 6.30 p.m. E. Hutchinson: "Plating Shop Layout."

MONDAY, MARCH 22

**Institution of Works Managers.** Institution of Engineers and Shipbuilders, 39 Elmbank Crescent, Glasgow, 7.0 p.m. D. G. Petrie: "Production Planning: Output Versus Paper."

**Institution of The Rubber Industry.** Engineers' Club, Manchester, 6.15 p.m. T. J. Meyrick and Dr. J. T. Watts: "Polyisocyanates: Some Applications in Bonding."

TUESDAY, MARCH 23

**Hull Chemical & Engineering Society.** Church Institute, Albion Street, Hull, 7.30 p.m. H. D. MacMurray: "Some Aspects of Modern Drying Practice."

WEDNESDAY, MARCH 24

**Oil & Colour Chemists' Association.** The Berkely, Queens Road, Bristol, 7.0 p.m. Dance and Supper-Buffet.

**Royal Institute of Chemistry** (Manchester Section): Engineers' Club, Manchester, 7.0 p.m. Dr. H. Wilkinson: "Food appreciation and Chemistry." (Dublin Section): Chemical Department, University College, Dublin, 7.30 p.m. Annual General Meeting.

**Society of Dyers and Colourists** (Midland Section). Victoria Station Hotel, Nottingham, 7.0 p.m. G. H. Lister: "The Absorption of Acid and Chrome Dyes by Wool."

THURSDAY, MARCH 25

**Institute of Metals.** James Watt Memorial Institute, Great Charles Street, Birmingham, 3, 6.30 p.m. L. F. Denaro: "The Metallurgy of Alloy Steel Welding."

FRIDAY, MARCH 26

**British Association of Chemists.** St. Enoch Hotel, Glasgow, 7.0 p.m. Short papers and discussion.

### Summer School of Chemistry

Arranged by the Irish Chemical Association, a summer school in chemistry will be held in the Department of Chemistry, University College, Dublin, from July 5 to 9 inclusive. A series of lectures will be given dealing with recent advances in chemotherapy, biochemistry, the determination of the structure of organic compounds, and the electronic theory in chemistry. One lecture in each subject will be given every day. Fees for the full course are: non-members £2 2s., members £1 11s. 6d., students 15s. Applications to attend the course should be sent before June 26, 1948, to the hon. secretary of the association, the Laboratory, 12 Dawson Street, Dublin, accompanied by the appropriate fee.

## Home News Items

**Cheaper Soap.**—Reduction in the prices of some toilet and laundry soaps was announced by Lever Brothers and Unilever, Ltd., this week, as part of their decision to implement the recommendations of the FBI's report on prices and profits.

**Easter Holidays.**—Glaxo Laboratories, Ltd., Greenford, will close from 5.30 p.m. on Thursday, March 25, until the normal hour for opening on Tuesday, March 30. A skeleton staff will be available on Saturday morning, March 27, for the acceptance of emergency orders.

**Scottish Trade Fair.**—Plans are now being prepared for a Scottish Trade Fair to be held early next year. The exhibition is intended to afford Scottish industrial concerns a chance to display their products. In past years a certain number of firms have held stands at the B.I.F., but the majority do relatively little exhibition work.

**Chemical Plant Sought.**—Among the engineering equipment now being sought in Scotland by foreign buyers, through the Engineering Centre, Ltd., in Glasgow, is a considerable amount of chemical and allied material. This includes oil extraction plant for coconut plantations, pumps, diesel and petrol engines, and dehydration and drying equipment for copra and other plantations. Ceylon is a particularly strong buyer at the present time.

**Petroleum Chemicals.**—Although for the purpose of publicising the scope of the petroleum and petroleum chemicals industries Manchester Oil Refinery, Ltd., and Petrochemicals, Ltd., collaborated to produce the display at the Ideal Home Exhibition (THE CHEMICAL AGE, March 6), both organisations are separate entities. The production of petroleum chemicals by the Catarole process, which was one of the interesting features of the Olympia exhibit, is entirely a Petrochemicals project.

**Post Office Awards.**—The two highest cash awards made so far this year by the Post Office Awards Committee include one of £150 shared by three skilled workmen at the Engineering Testing Branch, Birmingham. They combined to suggest an improved method of splicing lead-covered cables whereby the joint is given added strength while keeping the overall diameter of the splice to a minimum. The other award of £100 was granted to a draughtsman of the London Telecommunications Region for a design for a series of trolleys for drawing cables into tunnels.

**Stabilisation of Drug Prices.**—The Council of the Wholesale Drug Association is urging all members to accept the present discount rate fixed by the Prices of Goods Act, not to proceed with the request for an increased rate as originally contemplated, and to freeze present prices.

**Steady Coal Output.**—Maintenance of the recent improved coal output is shown in last week's total production of deep-mined and opencast coal, which amounted to 4,228,500 tons and was only 700 tons less than the previous week's figure, the highest since 1940.

**Retail Chemists' Sales.**—Following rises in retail chemists' sales in November and December, says the *Board of Trade Journal*, there was a decline of about one-fifth in January to the level that prevailed from July to October last year. The January (1948) sales, however, showed a rise of 6 per cent over those for the same month of 1947.

**Czech Petroleum Mission.**—A Czechoslovak petroleum mission is visiting this country to extend co-operation with the British petroleum industry and suppliers of refinery equipment. Its main objective is to obtain cooperation in the designing and construction of two new refineries which are to be built in Czechoslovakia, and the manufacture of chemicals, especially solvents, derived from petroleum.

**Cyanogen Chloride Bombs Disposal.**—Rejection by South Westmorland Rural Council of I.C.I.'s application to store 11,000 chemical bombs at Holme Park Fell (THE CHEMICAL AGE, January 31) has subsequently revealed that the chemical concerned was cyanogen chloride, which could be used in the manufacture of a valuable anti-malarial drug. I.C.I. has appealed against this decision, and an inquiry was held on Wednesday by an inspector of the Ministry of Town and Country Planning.

**Chemical Works Transferred.**—Colmick, Ltd., manufacturing chemists, who for some time have been winding up their works at Wingates, near Westhoughton, Lancs., in preparation for activities at Crewe Hall, Cheshire, has now closed down the last department at Wingates. The firm came to Westhoughton in September, 1941, after their Liverpool establishment had been damaged in the blitz, taking over the Grange in Church Lane, and employing about 80 local people. Several of the latter have decided to move to Crewe Hall where accommodation is being provided.

## Continental Steel Production

**T**HANKS principally to the improved coke supply position, there was a further increase in Belgium's steel production during January. Output totalled 307,000 tons, as compared with 290,000 tons in December, 1947. With the exception of certain countries belonging to the sterling area, sales abroad presented no difficulties. About 132,500 tons of crude steel are being shipped per month under existing trade agreements. Of this quantity, about 40,000 tons are sent to the Netherlands, 22,000 tons to Great Britain, 20,000 tons each to Sweden and Switzerland, 10,000 tons to Portugal, 8000 tons to Finland, 7500 tons to Denmark and about 5000 tons to Norway. Moreover, several new delivery contracts have recently been signed with a number of customers in Latin America.

Italy produced last year some 320,000 tons of pig-iron and about 1,700,000 tons of steel. These figures represent about 36 and 73 per cent, respectively, of the annual average for the last three pre-war years. It is hoped to increase steel output this year to at least 2 million tons, enough for home requirements. Furthermore, when the Bagnoi blast furnace resumes operations, pig-iron output should increase by some 80,000 tons.

## CHEMICAL WOOD PULP

**A** N agreement has been reached with Finland for the supply to the U.K. of 190,000 tons of chemical wood pulp, 30,000/40,000 tons of mechanical wood pulp, and 150,000 cubic fathoms of pit-props, and other timber. Contract terms for certain of these products are still under negotiation. In return, Finland is to receive 500,000 tons of coal and coke, and 40,000 tons of steel, and manufactured goods.

## Official Notices

**Key Industry Duty Exemption.**—The Treasury has made an order exempting monochloracetic acid from Key Industry Duty for the period beginning March 3, 1948, and ending August 19, 1948. The order is entitled "The Safeguarding of Industries (Exemption) (No. 1) Order, 1948," and is published as Statutory Instrument, 1948, No. 390. A further order made under Section 10 (5) of the Finance Act, 1926, exempts cyclohexanol, cyclohexanone and ethyl acrylate from key industry duty for the period beginning March 13, 1948, and ending with August 19, 1948.

## Overseas News Items

**Tin Council for Netherlands Indies.**—The establishment of a Netherlands Indies Tin Council has been announced. It will direct the general policy of tin mining, smelting and sales in the Netherlands Indies.

**Tanganyika Kaolin Development.**—Development of Tanganyika's rich kaolin deposits (30-36 per cent content kaolin compared with Cornwall's 12-13 per cent) is reported to be imminent, following the recent examination of deposits in the Pugu Hills.

**Pulp from Guiana.**—Mr. D. Hetram, West Indies student at King's College, Newcastle, in a recent address to Jarro Rotarians, asserted that Britain's newsprint shortage could be solved by development of British Guiana's wood pulp industry.

**Canadian Chemical Imports.**—Imports of chemicals into Canada in 1947 (in million dollars, figures in parentheses representing 1938 and 1946 respectively) amounted to 113.1 (35.2 and 92.9); iron and products 762.4 (162.6 and 491.1); non-ferrous metals and products 160.9 (38.4 and 120.3).

**Southern Rhodesian Imports.**—Imports of oils, waxes, resins, paints, etc., into Southern Rhodesia which in September 1946 were worth £151,395, rose to £182,558 in October, and in the first ten months of 1947 were more than 1½ times the value of those in the first ten months of 1946, the respective figures being £1,143,706 and £740,573.

**Canadian Tariff Amendment.**—The Canadian Department of Revenue has made the following amendment to the customs tariff on methyl ethyl ketone, methyl normal propyl ketone, and methyl isobutyl ketone, when imported for oil-refining purposes only: British preferential tariff, free; intermediate tariff, free; and general tariff 25 per cent. The amendment took effect from January 1.

## RECORD U.S. EXPORTS

**E**XPORTS of U.S. goods and services reached the highest peacetime level during 1947, reports the U.S. Department of Commerce. The total of \$19,600 million was \$4400 million in excess of the previous year. Import figures also rose from \$7100 to \$8300 million during last year. The export surplus of \$11,300 million on goods and services was financed through Government grants and loans to the extent of \$560 million, of which approximately half represented disbursements on the loan to the U.K. Foreign countries had to liquidate \$4500 million of their gold and dollar reserves, compelling most of them to restrict imports from the U.S.

# Indian Chemical Development Plans

(From Our Own Correspondent)

THE Government of Pakistan is considering the commercial exploitation of the large deposits of chromite found in the Hindu Bagh in Baluchistan and in Kalat State. Current output from the Baluchistan source is nearly 2000 tons a month. This is exported to the U.K. for production of high grade steel. Mr. A. K. Meta, chief geologist to Kalat durbar, has suggested to the Pakistan Government that they should enter into a barter agreement with India to exchange chromite for iron and pig iron. Although some experts are sceptical, Pakistan is considering whether the chromite can be used for production of iron in its own territory. India's requirements of chromite are stated to be in the neighbourhood of 10,000 tons a year, of which she has only relatively small indigenous deposits in Madras.

\* \* \*

Investigation of the mineral resources of India will be the aim of an organisation that is being set up under the Indian Academy of Sciences, Bangalore. It will begin to function next month under Dr. C. V. Raman, who will direct scientific investigations.

The Government of Mysore having given the institute 11 acres of land for a site and the institute having obtained from private contributions a sum of Rs.408,000, the Standing Finance Committee of the Dominion Assembly has sanctioned a non-recurring grant of Rs.300,000.

\* \* \*

The possibilities of future development of basic chemical industries in India were discussed at a conference held at Dhanbad between representatives of the Government of India, West Bengal and Bihar, and of the Damodar Valley Corporation. Sir J. G. Ghosh, Director-General of Industries, India; Mr. S. K. Majumdar, chairman of the Damodar Valley Corporation; Dr. Syed Mahmud, Minister of Bihar; and Dr. C. C. Banerjee, Commerce Minister of West Bengal, attended. They expressed their desire for joint action in the matter, and a tentative resolution accepting the principle was adopted.

\* \* \*

The technological sub-committee of the Indian Oil Seeds Committee, which met at Nagpur under the chairmanship of Sir Datar Singh, vice-chairman of the Indian Council of Agricultural Research, has decided to consider, in the first instance, technological research relating to oil seeds and oil seed products carried out at various

research institutes throughout India. Its object is to summarise and classify, according to usefulness, work already carried out.

The committee has also decided to place orders with an English firm for a machine to convert linseed straw into fibre. If the experiment is successful it is hoped that orders will be placed for more machines. The Village Oil Industry and Crushing Sub-Committee also decided that a training institute should be established at Nagpur. It was decided, among other things, to develop the village oil industry in consultation with the Provincial Governments, and to recommend the Central Government to take strong measures to improve the quality of expellers manufactured in India.

## Ammonium Nitrate

Canadian Process Patented

A PATENT has been granted in Ottawa for an ammonium nitrate manufacturing process, of which the co-inventors are give as Leonard F. Wright and Robert Hendricks. The process is described as follows:

The production of ammonium nitrate in granular form which comprises spraying at a temperature above its saturation temperature, an aqueous ammonium nitrate solution having a saturation temperature within the range of from 115°C. to 135°C., into a gaseous cooling medium maintained at a lower temperature, whereby the outer surface of each individual droplet is suddenly chilled and crystallises in the form of a shell, cooling the granules to a temperature below 84°C. in the gaseous cooling medium, removing the granules from the spraying step of the process and drying the granules in a heated gaseous drying medium to remove the major portion of the moisture content of granules, and thereafter cooling and drying the granules in a cooler gaseous drying medium to reduce the moisture content of the granules to less than 0.5 per cent.

**I.C.I. Resins Blaze.**—A fire destroyed the entire contents of a resin store in the early hours of March 12, at the Huddersfield dye-stuffs factory of I.C.I., Ltd. The I.C.I. fire brigade tackled the fire, which was confined to a single-storey corrugated-iron building about 200 ft. by 75 ft., until the arrival of the Huddersfield N.F.S. The building was extensively damaged.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

### Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.)

UNITED SUA BETONG RUBBER ESTATES, LTD., Dorking. (M., 20/3/48.) February 19, charge, to Industrial Rehabilitation Finance Board securing all sums advanced under a certain guarantee; charged on certain properties. \*Nil. July 28, 1947.

MAMBAU (F. M. S.) RUBBER CO., LTD., London, E.C. (M., 20/3/48.) February 10, mortgage, securing to Industrial Rehabilitation Finance Board, Malaya, all sums which the mortgagees may be called upon to pay under or by reason of a certain guarantee; charged on property situated in Negri Sembilan, Malaya Union. \*Nil. February 11, 1947.

PEST CONTROL, LTD., Harston. (M., 20/3/48.) February 14, second puisne mortgage, to Midland Bank, Ltd., securing all moneys due or to become due to the bank; charged on Buccleugh, Harston, with fixtures; also February 14, second mortgage, to Midland Bank, Ltd., securing all moneys due or to become due to the bank; charged on The Limes, Northams Lane, Holbeach, with four cottages and fixtures. \*£137,149. April 22, 1947.

### Satisfactions

INDUSTRIAL COLLOIDS, LTD., Altrincham, chemical manufacturers. (M.S., 20/3/48.) Satisfaction February 20 of mortgage registered June 4, 1937.

HAIRLOCK CO., LTD., Bedford, rubber manufacturers. (M.S., 20/3/48.) Satisfactions February 17 of registered notes registered February 28, 1934, to the extent of £1000 and of charge registered September 26, 1945, to the extent of £1000.

## New Companies Registered

**Hawke Products, Ltd.** (450,595).—Private company. Capital £100. Precision, constructional, electrical and chemical engineers, tool and machine tool makers, etc. Directors: L. A. Murphy, and F. T. A. Hawkins. Reg. office: 9 Shelton Street, W.C.2.

**Oxyda, Ltd.** (450,496).—Private company. Capital £1000. Importers and exporters of, and agents for chemicals, drugs, medicines, etc. Mohamed Yunas is the first director. Reg. office: 49 Cannon Street, E.C.4.

**Micronised Pigments, Ltd.** (450,576).—Private company. Capital £20,000. Manufacturers of earths, ochres, oxides, colours, dyes, paints, varnishes, chemicals, etc. Directors: G. H. Key, and C. M. Beavis. Reg. office: The Golden Valley, Wick, near Bristol.

**Domestic Chemical Co., Ltd.** (450,147).—Private company. Capital £2000. To acquire the business of chemical manufacturers and distributors carried on by J. W. Lee, J. A. Graham and Wm. J. C. Graham, at King Street, Exeter, as the "Domestic Chemical Company." Directors: H. J. W. Lee, J. A. Graham and Wm. J. C. Graham. Reg. office: 94 Queen Street, Exeter.

## Company News

**Powell Duffryn, Ltd., and William Cory and Son, Ltd.**, have jointly acquired all the share capital of John Kelly, Ltd., steamship owners, coal importers and distributors, of Belfast. The newly acquired business interests extend throughout Northern Ireland and to other important distributing centres in Eire.

## Chemical and Allied Stocks and Shares

**S**TOCK markets have turned firmer on wider recognition that limitation of dividends at last year's rates might be preferable to another increase in the Profits Tax. There are many points which emerge from this, for example, the rate of dividend that could hitherto be proposed by a company out of the dividend list. These and similar matters will no doubt be clarified in due course, and with the Budget scheduled for April 6, markets will not have long to wait.

It is true that limiting dividends to last year's rates will rob industrial shares of speculative interest. Nevertheless, the tendency will no doubt be for earning power, or the rate of dividend earned (and not the actual dividend payment) to have a governing influence on the market value of industrial shares.

Chemical and kindred shares reflected the firmer conditions. Imperial Chemical rallied to 47s. 6d. in recognition that the yield compares favourably with that on other leading industrial shares, and that the market believes there are good prospects of the total payment for the year being maintained at 10 per cent. British Oxygen

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improved to 94s. 4d., British Aluminium to 46s. 6d., United Molasses to 47s. 3d., while the units of the Distillers Co. have been firmer at 26s. 3d.

W. J. Bush were quoted at 85s., B. Laporte 5s, units at 22s. 6d., Fisons 60s., and British Drug Houses 5s, shares rallied to 11s. 3d. Elsewhere, British Glues 4s. ordinary were 18s. 9d. and, reflecting the full financial results, Blythe Colour 4s. ordinary shares have been firm at 57s. 9d. Dunlop Rubber were better at 70s. 3d., but General Refractories, since publication of the past year's results, have eased to 21s. 4d. Glaxo Laboratories declined to 17s. Shares which had been the subject of higher dividend hopes have in many instances moved down on balance for the week.

Iron and steels were steady, United Steel at 29s., Dorman Long 30s. 9d., and Colvilles 30s. 3d.—all slightly higher. Nevertheless, the decision of John Summers not to increase the year's dividend has led to the view that dividend limitation may bear unfavourably on iron and steel compensation in the event of nationalisation, because payment might be based to some extent on the market value of the shares.

Textiles have been firm in view of the stepping up of the industry's export targets, which ultimately must result in increased distribution. Many textile shares offer good yields and buying interest has centred on them.

Boots Drug were firmer at 51s. 6d., Sangers better at 32s. 6d., and Timothy Whites 38s. Beechams deferred strengthened to 20s. attention being drawn to the good yield. On the other hand, oil shares lost ground, more particularly, Anglo-Iranian, V.O.C., London & Thames Haven and others which had recently been the subject of higher dividend hopes. Dividend limitation will mean that for the present oil shares generally offer only small yields, but the market believes that there is big scope for expansion in earnings of the leading oil companies.

## British Chemical Prices

### Market Reports

THE past week has been without any special feature as far as the industrial chemical market is concerned. Buyers continue to be prominent in most sections of the market and a fair volume of new business is in circulation, although uncertain delivery dates are an obstacle to firm bookings. The price position generally is unaltered, notable exceptions being white lead and red lead which have been reduced to the rates ruling in December last. There has been a good demand for acetone, form-

aldehyde and the ammonia compounds, and other active items include sulphur, hydrogen peroxide and arsenic. In the soda products there has been a steady call for supplies, with chlorates, bichromates, yellow prussiates and the phosphates of soda in strong demand relative to the quantities available. Activity in the coal-tar products market continues to be ruled by the supply position and the overall demand is in excess of current production. Pitch is a good export item and creosote oil and cresylic acid are also meeting with a steady inquiry for shipment.

MANCHESTER.—Trading conditions on the Manchester chemical market during the past week, so far as the home section is concerned, have been reasonably satisfactory in most departments. Inquiries from users in the textile and allied trades, as well as in the glass, rubber and paper-making sections, have been fairly numerous and existing contracts are being drawn against steadily, a regular flow of delivery specifications being reported. Shippers are also coming forward with offers of additional export business and the volume of actual shipments is being satisfactorily maintained. Prices generally have been well held, with makers of red and white leads meeting with a steady demand at the lower values which came into force last week.

GLASGOW.—There has been no noteworthy change in the Scottish chemical market during the week. Prices have remained unaltered and the demand and supply position has maintained the usual level. In the export market there have been signs of improvement, but it has been noted that the French and Belgian manufacturers are now offering trisodium phosphate at prices below those ruling in this country.

## SPANISH PYRITES FOR FRANCE

FURTHER details are now available about the recent barter arrangement between France and Spain, involving some 160,000 tons of Spanish pyrites in exchange for about 100,000 tons of French phosphates. This deal marks the resumption of the traditional supply of Spanish pyrites, which was interrupted for about two years because of the closing of the frontier between France and Spain. Although pyrites were meanwhile supplied by Sweden, Norway, Portugal and Greece, with additional offers of 200,000 tons from Canada, it was not an ideal solution for the cost of supplies from those sources was considerably higher. Moreover, Spanish pyrites are more suitable for the needs of French metallurgical works. A new agreement may therefore soon be signed.

## Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each.

### Complete Specifications Open to Public Inspection

Methods of preparing aqueous dispersions of an acid reacting synthetic resin, and the sizing adjunct resulting therefrom.—Monsanto Chemical Co. July 28, 1942. 1127/48.

Process for the emulsion polymerisation of polymerisable substances.—N. V. de Bataafsche Petroleum Maatschappij. July 31, 1946. 18098/47.

Process for the conversion of hydrocarbons. N. V. de Bataafsche Petroleum Maatschappij. July 27, 1946. 19390-31/47.

Production of vanadium from the ashes of petroleum coke.—N. V. Branderij en Gistfabriek Hollandia II. October 30, 1939. 35312/47.

Process for the manufacture and application of polar synthetic resins.—N. V. Octrooien Maatschappij "Activit." January 25, 1940. 35139/47.

Preparation of  $\beta$ -phthalimids propane derivatives or  $\beta$ -alanine.—National Oil Products Co. July 25, 1946. 18069/47.

Method of producing ammonia from hydrogen and nitrogen.—S. O. B. Odelhog. July 30, 1946. 20517/47.

Process for the manufacture of acid dyes stuffs of the anthraquinone series.—Sandoz, Ltd. July 26, 1946. 19157-58/47.

Thiocarbamyl chlorides and the manufacture thereof.—Sharples Chemicals, Inc. February 2, 1946. 154/48.

Water-repellant compositions.—Soc. des Usines Chimiques Rhone-Poulenc. July 17, 1946. 20699/46.

Process of case hardening metals and their alloys.—F. J. Sowa. February 4, 1944. 35036/47.

Laminated products, adhesives therefor and process of laminating.—F. J. Sowa. July 25, 1945. 35037-38/47.

Process for making organo-silicon compounds.—F. J. Sowa. July 25, 1945. 35039/47.

Process for the manufacture of cold hardening phenol formaldehyde resins and products prepared therefrom.—Spolek Pro Chemickou A Hutri Vyrobu, Narodni Podnik. September 18, 1942. 35252/47.

Process for the production of titanium dioxide particularly suitable for use in pigments.—Spolek Pro Chemickou A Hutri Vyrobu, Narodni Podnik. February 26, 1942. 35341/47.

Compounded oil.—Standard Oil Co. of California. February 23, 1942. 931/48.

Hydrogen production.—Standard Oil Development Co. (Divided out of 18513/47.) January 8, 1941. 29768/47.

6-substituted thiouracil compounds and process of preparing the same.—Sterling Drug, Inc. July 30, 1946. 16335/47.

6-substituted thiouracil compounds and process of preparing the same.—Sterling Drug, Inc. July 30, 1946. 16336/47.

Preparation of 4-aryl-4-aminomethyl-piperidine derivatives.—Sterling Drug, Inc. July 30, 1946. 17847/47.

Treatment of cellulosic materials.—Traitement Chimique Des Vegetaux, Soc. Anon. February 11, 1944. 35294/47.

Dehydration of aqueous solutions of formic acid.—Usines de Melle. April 4, 1941. 35052/47.

Fabrication of light metals.—Aluminum Co., of America. Nov. 1, 1945. 729/48.

Fabrication of light metals.—Aluminum Co., of America. Nov. 1, 1945. 730-31/48.

Aluminium conductor metal.—Aluminum Co., of America. Aug. 2, 1939. 1019/48.

Handling of molten magnesium and magnesium base alloys.—Aluminum Co., of America. July 10, 1942. 1131-32/48.

Aluminium base metals.—Aluminum Co., of America. Sept. 19, 1939. 1133/48.

Polarised light ultra violet comparison photometers.—American Cyanamid Co. Aug. 1, 1946. 18551/47.

Process of preparing nitriles.—Armour & Co. Oct. 5, 1940. 2037/48.

Methods of securing together adhesively a portion of vinyl resin material and a second portion of material.—B.B. Chemical Co., Ltd. Aug. 1, 1946. 20026/47.

Manufacture of organic sulphites.—British Celanese, Ltd. Dec. 21, 1944. 638/48.

Aqueous hydrolysis reactions of hydrolysable fatty materials.—Colgate-Palmolive-Peet Co. May 15, 1941. 20442/45.

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## SITUATIONS VACANT

*None of the vacancies in these columns relates to a man between the ages of 18 and 50 inclusive, or a woman between the ages of 18 and 40 inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order.*

### CITY OF OXFORD

### APPOINTMENT OF TECHNICAL ASSISTANT— CHEMIST

APPLICATIONS are invited for the appointment of Technical Assistant—Chemist in the Sewage Purification Section of the City Engineer's Department. The salary will be Grade IV of the National Joint Council for Local Authorities' Scale, A.P.T. Division i.e., £480 by £15 to £525 per annum.

The duties of the appointment will include the sampling and chemical examination and control of trade effluents, together with the inspection of pre-treatment plants and chemical work associated with the operation of pilot plants for sewage and sludge treatment. Applicants should possess an appropriate qualification in Chemistry, together with the Associate-Membership Examination, with Chemistry as a principal subject, of the Institute of Sewage Purification.

The appointment will be terminable by one month's notice on either side and subject to the provisions of the Local Government Act, 1937. The successful applicant will be required to pass a medical examination and to devote his whole time to the duties of the office.

Applications, giving the names of three persons to whom reference may be made, should reach the City Engineer, Town Hall, Oxford, not later than Monday, 29th March, 1948.

Town Hall,  
Oxford,  
2nd March, 1948.

H. PLOWMAN,  
Town Clerk.

## SITUATIONS VACANT

### SURREY COUNTY COUNCIL

APPLICATIONS are invited from men and women for the post of Technical Assistant in the Central Purchasing Department. The officer appointed, who should possess an honours degree in chemistry or the equivalent qualification, will be required under the general direction of the Chief Supplies Officer, to be responsible for the testing of various commodities purchased, and to assist in the formulation of specifications and other technical matters.

Preference will be given to applicants who have had general analytical experience in the examination and testing of a wide range of commodities.

Salary on National Scale Grade V (£520 x £15/20-£570 per annum), plus London Weighting Allowance of £20, the commencing salary depending upon the qualifications and experience of the person appointed.

The appointment is subject to the staffing regulations of the Council and to the provisions of the Local Government Superannuation Act, 1937. The person appointed will be required to pass a medical examination.

Applications, stating age, qualifications and details of experience accompanied by copies of not more than three recent testimonials, should be addressed to the Chief Supplies Officer, 3, Palace Road, Kingston-on-Thames, the envelope endorsed "Technical Assistant," so as to reach him not later than the 10th April, 1948. Canvassing either directly or indirectly, will lead to disqualification.

DUDLEY AUCKLAND,  
Clerk of the Council.

County Hall,  
Kingston-on-Thames.

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